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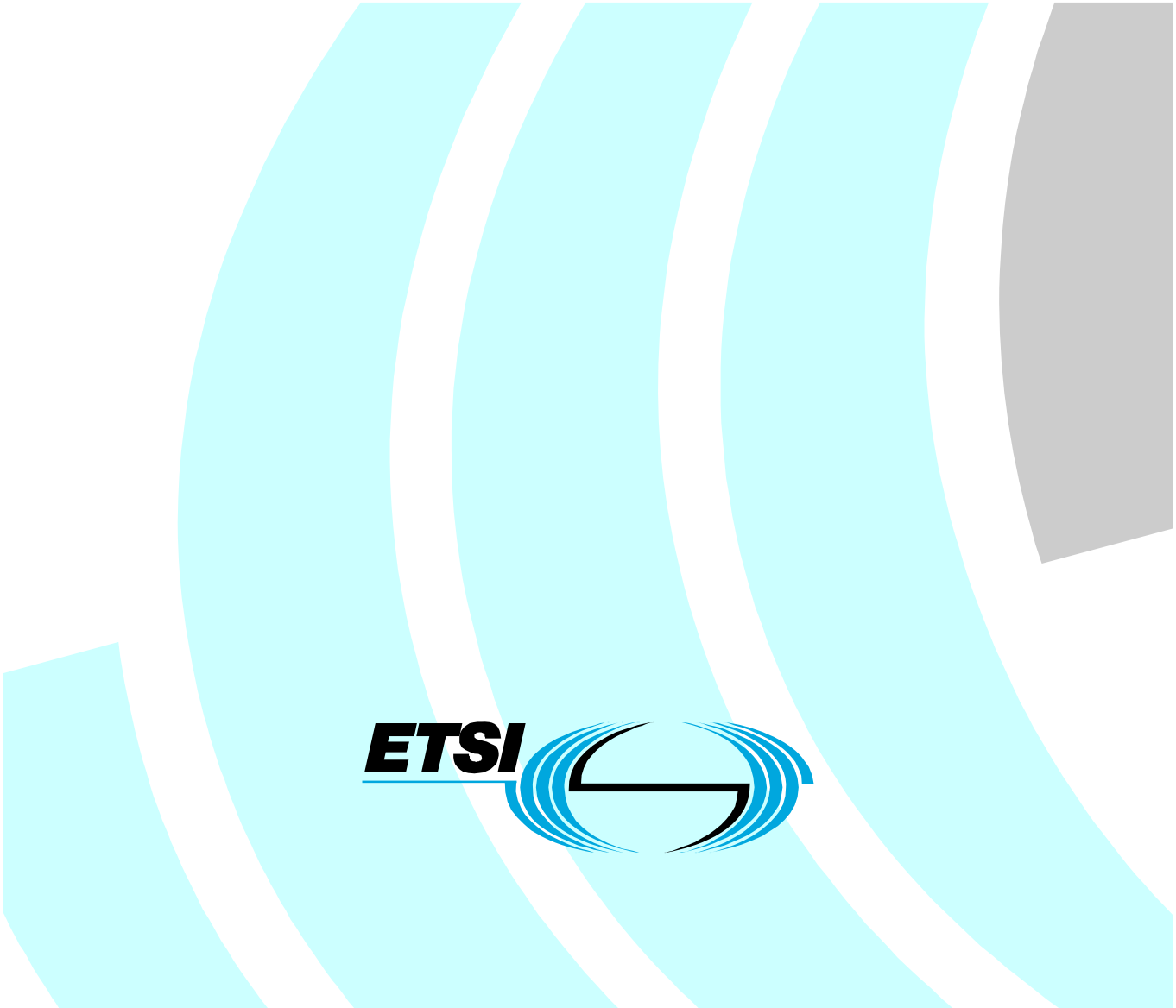
ETSI Standard

Methods for Testing and Specification (MTS);
The Testing and Test Control Notation version 3;
Part 6: TTCN-3 Control Interface (TCI)



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Contents

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS).

The present document is part 6 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

1 Scope

The present document specifies the control interfaces for TTCN-3 test system implementations. The TTCN-3 Control Interfaces provide a standardized adaptation for management, test component handling and encoding/decoding of a test system to a particular test platform. The present document defines the interfaces as a set of operations independent of a target language.

The interfaces are defined to be compatible with the TTCN-3 standard (see clause 2). The interface definition uses the CORBA Interface Definition Language (IDL) to specify the TCI completely. Clauses 8, 9 and 9.7 present language mappings for this abstract specification to the target languages Java, ANSI C, and C++. A summary of the IDL-based interface specification is provided in annex A.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[2] ETSI ES 201 873-4: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 4: TTCN-3 Operational Semantics".

[3] ETSI ES 201 873-5: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 5: TTCN-3 Runtime Interface (TRI)".

[4] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[5] ISO/IEC 10646-1: "Information technology - Universal Multiple-Octet Coded Character Set (UCS) - Part 1: Architecture and Basic Multilingual Plane".

[6] W3C Recommendation: "XML Schema Part 0: Primer".

NOTE: See at http://www.w3.org/TR/xmlschema-0/.

[7] W3C Recommendation: "XML Schema Part 1: Structures".

NOTE: See at http://www.w3.org/TR/xmlschema-1/.

[8] W3C Recommendation: "XML Schema Part 2: Datatypes".

NOTE: See at http://www.w3.org/TR/xmlschema-2/.

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-1 [4] and the following apply:

Abstract Test Suite (ATS): test suite composed of abstract test cases

codec: encoder/decoder entity used for encoding and decoding data to be transmitted and received, respectively

Coding/Decoding (CD): entity that administers the value and type handling incl. encoding and decoding in the TTCN-3 test system

Component Handling (CH): entity that administers the handling of test components in the TTCN-3 test system

communication port: abstract mechanism facilitating communication between test components

NOTE: A communication port is modelled as a FIFO queue in the receiving direction. Ports can be message-based, procedure-based or a mixture of the two.

control component: component that executes the behaviour of the control part of a TTCN-3 module

Executable Test Suite (ETS): Refer to ISO/IEC 9646-1 [4].

Implementation eXtra Information for Testing (IXIT): Refer to ISO/IEC 9646-1 [4].

Platform Adaptor (PA): entity that adapts the TTCN-3 Executable to a particular execution platform

NOTE: The Platform Adaptor creates a single notion of time for a TTCN-3 test system, and implements both, explicit and implicit, timers as well as external functions.

real test system interface: Refer to ISO/IEC 9646-1 [4].

System Under Test (SUT): Refer to ISO/IEC 9646-1 [4].

SUT Adaptor (SA): entity that adapts the TTCN-3 communication operations with the SUT based on an abstract test system interface

NOTE: It implements the real test system interface.

Testing and Test Control Notation (TTCN-3): Refer to ISO/IEC 9646-1 [4].

test case: Refer to ISO/IEC 9646-1 [4].

test event: either sent or received test data (message or procedure call) on a communication port that is part of the test system interface as well as timeout events of timers

Test Logging (TL): entity which provides logging information about test execution (including also the information provided by the TTCN-3 log statement)

Test Management (TM): entity which provides a user interface to as well as the administration of the TTCN-3 test system

Test Management and Control (TMC): set of entities providing test management and control; consists of the Test Management (TM), the Component Handling (CH), the Test Logging (TL) and the Coding/Decoding (CD)

NOTE: The TMC is an implementation of TCI.

test system: Refer to ISO/IEC 9646-1 [4].

Test system interface (TSI): test component that provides a mapping of the ports available in the (abstract) TTCN-3 test system to those offered by a real test system

TTCN-3 Executable (TE): part of a test system that deals with interpretation or execution of a TTCN-3 ETS

TTCN-3 Control Interfaces (TCI): four interfaces that define the interaction of the TTCN-3 Executable with the test management, the coding and decoding, the test component handling, and the logging in a test system

TTCN-3 Runtime Interface (TRI): two interfaces that defines the interaction of the TTCN-3 Executable between the SUT and the Platform Adapter (PA) and the System Adapter (SA) in a test system

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
ATS	Abstract Test Suite
CD	(External) Coding/Decoding
CH	Component Handler
CORBA	Common Object Request Broker Architecture
ETS	Executable Test Suite
IDL	Interface Definition Language
IXIT	Implementation eXtra Information for Testing
MTC	Main Test Component
OMG	Object Management Group
PA	Platform Adaptor
PTC	Parallel Test Component
SA	SUT Adaptor
STL	Standard Template Library of C++
SUT	System Under Test
TCI	TTCN-3 Control Interfaces
TE	TTCN-3 Executable
TL	Test Logging
TM	Test Management
TMC	Test Management and Control
TRI	TTCN-3 Runtime Interfaces
TSI	Test System Interface
TTCN-3	Testing and Test Control Notation Version 3
UML	Unified Modelling Language
W3C	World Wide Web Consortium
XML	eXtensible Markup Language

4 Introduction

The present document consists of two distinct parts, the first part describing the structure of a TTCN-3 test system implementation and the second part presenting the TTCN-3 Control Interfaces specification.

The first part introduces the decomposition of a TTCN-3 test system into four main entities:

- Test Management and Control (TMC).
- TTCN-3 Executable (TE).
- SUT Adaptor (SA).
- Platform Adaptor (PA).

The TMC consists itself of three entities: Test Management (TM), Coder/Decoder (CD), and Test Component Handler (CH). In addition, the interaction between these entities, i.e. the corresponding interfaces, is defined.

The second part of the present document specifies the TTCN-3 Control Interfaces (TCI). The interfaces are defined in terms of operations implemented as part of one entity and called by other test system entities. For each operation, the interface specification defines associated data structures, the intended effect on the test system and any constraints on the usage of the operation. Note that these interface specifications only define interactions between the TE and TM, TE and CD, and TE and CH. For interactions between the TE and SA and the TE and PA please refer to the TTCN-3 Runtime Interface specification (ES 201 873-5 [3]).

5 Compliance

The minimum required for a TCI compliant TTCN-3 test system is to adhere to the interface specification stated in the present document. The TTCN-3 semantics in the test system must adhere to the operational semantics defined in ES 201 873-4 [2]. In addition, one language mapping must be supported. For example, if a vendor supports Java, the TCI operation calls and implementations, which are part of the TTCN-3 executable, must comply with the IDL to Java mapping specified in the present document. For the logging interface, the XML mapping can be used instead of the Java or the C mapping.

6 General structure of a TTCN-3 test system

A TTCN-3 test system can be thought of conceptually as a set of interacting entities. Each entity implements specific test system functionality. These entities:

- manage test execution;
- interpret or execute compiled TTCN-3 code;
- realize proper communication with the SUT;
- administer types, values and test components;
- implement external functions; and
- handle timer operations.

6.1 Entities in a TTCN-3 test system

The structure of a TTCN-3 test system implementation is illustrated in figure 1.

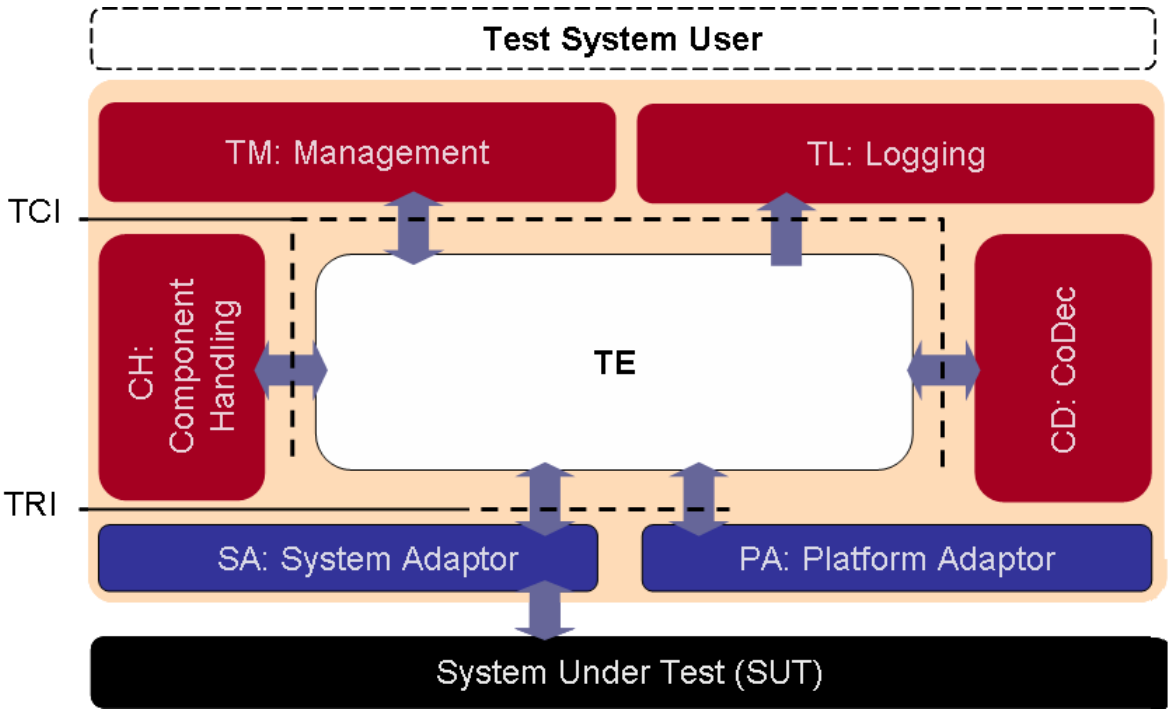

Figure 1: General structure of a TTCN-3 test system

As shown in figure 1, the TTCN-3 Executable (TE), also referred to as the Executable Test Suite (ETS), interprets and executes TTCN-3 modules. Various TE structural elements can be identified: control, behaviour, components, types, values and queues. The structural elements within the TE represent functionality that is defined within a TTCN-3 module or by the TTCN-3 standard (ES 201 873-1 [1]) itself. For example, the structural element "Control" represents the control part within a TTCN-3 module, while the structural element "Queues" represents the requirement on a TTCN-3 Executable that each port of a test component maintains its own port queue. While the first is specified within a TTCN-3 module, the latter is required by the TTCN-3 specification.

Refinement of the TE, as shown in figure 1, is provided as an aid in defining the TTCN-3 Control Interfaces. The TE would typically correspond in a test system implementation either to the executable code produced by a TTCN-3 compiler or by a TTCN-3 interpreter.

The TE may be executed in a centralized or in a distributed manner. That is, on a single test device or across several test devices respectively. Although the structural entities of the TE implement a complete TTCN-3 module, single structural entities might be distributed over several test devices.

The TE implements a TTCN-3 module on an abstract level. The other entities of a TTCN-3 test system make these abstract concepts concrete. For example, the abstract concept of sending a message or receiving a timeout cannot be implemented within the TE. The remaining part of the test system implements the encoding of the message and its sending over concrete physical means or measuring the time and determining when a timer has expired, respectively.

The SA and PA and their interaction with the TE are defined in ES 201 873-5 [3]. The TCI specification defines the interaction between the TE and the TMC.

The logging interface provides logging capabilities to all elements of the test system architecture, i.e. the TE, the TM, the CH, the CD, the SA and the PA are able to log information on the test execution via TL. Figure 2 represents a more detailed view on TL.

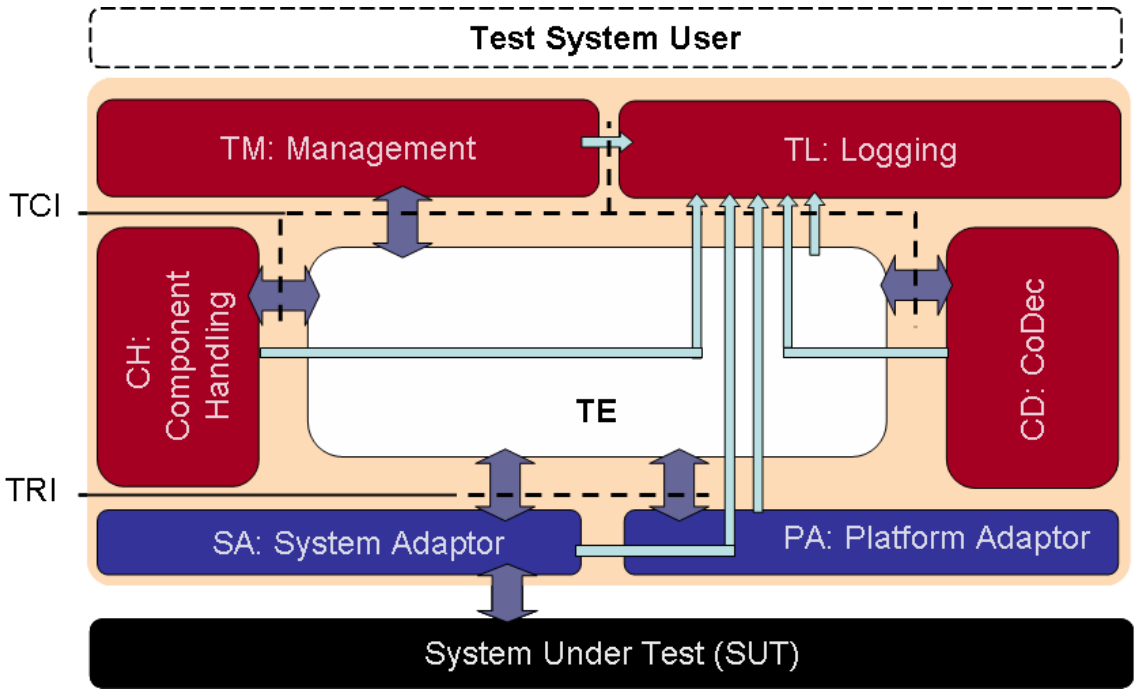

Figure 2: Detailed View on TL

6.1.1 Test Management and Control (TMC)

The TMC entity includes functionality related to management of:

- test execution;
- components;
- encoding and decoding; and
- logging.

6.1.1.1 Test Management (TM)

The TM entity is responsible for the overall management of a test system. After the test system has been initialized, test execution starts within the TM entity. The entity is responsible for the proper invocation of TTCN-3 modules, i.e. propagating module parameters such as IXIT information to the TE if necessary. Typically, this entity would also implement a test system user interface.

6.1.1.2 Coding and Decoding (CD)

The CD entity is responsible for the external encoding and decoding of TTCN-3 values into bitstrings suitable to be sent to the System Under Tests (SUT). Whenever external codecs are used, the TE determines which codecs shall be used. It passes the TTCN-3 data to the appropriate encoder to obtain the encoded data. Received data is decoded in the CD entity by using the appropriate decoder, which translates the received data into TTCN-3 values.

6.1.1.3 Component Handling (CH)

The TE can be distributed among several test devices. The CH implements communication between distributed test system entities. The CH entity provides the means to synchronize test system entities which might be distributed onto several nodes.

NOTE 1: Nodes and test devices are used as synonyms.

The general structure of a test system distributed among several nodes is depicted in figure 3.

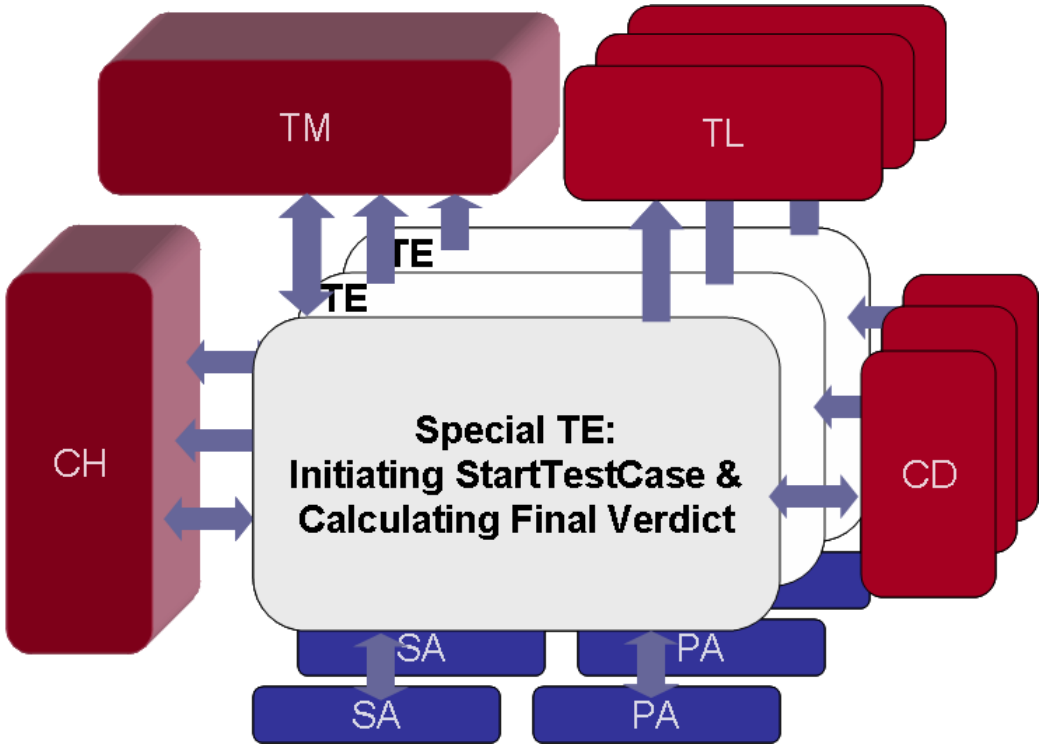

Figure 3: General structure of a distributed TTCN-3 test system

Each node within a test system includes the TE, SA, PA, CD and TL entities. The entities CH and TM mediate the test management and test component handling between the TEs on each node. The TE which starts a test case is a special TE. It shall calculate the final test case verdict. Besides this, all TEs are handled the same.

NOTE 2: As stated in ES 201 873-4 [2], a test system executes at most one test case at a given point in time, i.e. a TTCN-3 module cannot execute multiple test cases at the same time.

The creation of the MTC, PTCs and the control component in TEs is controlled by CH. Please note the special role of the system component, which exists only conceptually and not as a running test component in a TE. System ports, i.e. the ports of the system component, may be distributed among several nodes. Further, test components on different nodes may have access to the same physical port of the SUT, i.e. they may be mapped to the same port of the test system interface.

EXAMPLE: Access to remote real SUT ports can be realized by TEs via local proxies.

Communication between TTCN-3 components is either message or procedure based. Therefore, the CH adapts message and procedure based communication of TTCN-3 components to the particular execution platform of the test system. It is aware of connections between TTCN-3 test component communication ports. It propagates send request operations from one TTCN-3 component to another TTCN-3 component. The receiving component may reside in a different instance of the same TE located on a different node. It then notifies the TE of any received test events by enqueueing them in the port queues of the TE.

Procedure based communication operations between TTCN-3 components are also visible at the CH. The CH shall distinguish between the different kinds of procedure-based communication, i.e. call, reply, and exception, and shall propagate them in the appropriate manner to the TE where the target component resides. TTCN-3 procedure based communication semantics, i.e. the effect of such operation on TTCN-3 test component execution, are to be handled in the TE.

Additional communication is needed to implement the distribution of test components onto several nodes. Component management communication includes the indication of the creation of test components, the starting of execution of a test component, verdict distribution, as well as component termination indication. The CH does not implement the TTCN-3 component behaviour. Rather, it implements the communication between several components implemented by a TE.

6.1.1.4 Test Logging (TL)

The TL entity performs test event logging and presentation to the test system user. It provides the logging of information about the test execution such as which test components have been created, started and terminated, which data is sent to the SUT, received from the SUT and matched to TTCN-3 templates, which timers have been started, stopped or timed out, etc.

6.1.2 TTCN-3 Executable (TE)

The TE entity executes or interprets a TTCN-3 module. Conceptually, the TE can be decomposed into six interacting entities: a Control, Behaviour, Component, Type, Value, and Queue entity. This structural decomposition of the TE is defined in ES 201 873-5 [3]. The terminology for TE defined in ES 201 873-5 [3] is used within the present document.

6.1.3 SUT Adaptor (SA)

The SA is the implementation of the System under Test Adaptor (SA) as defined in ES 201 873-5 [3]. The terminology for SA defined in ES 201 873-5 [3] is used within the present document.

6.1.4 Platform Adaptor (PA)

The PA is the implementation of the Platform Adaptor (PA) as defined in ES 201 873-5 [3]. The terminology for PA defined in ES 201 873-5 [3] is used within the present document.

6.2 Execution requirements for a TTCN-3 test system

Each TCI operation call shall be treated as an atomic operation in the calling entity. The called entity, which implements a TCI operation, shall return control to the calling entity as soon as its intended effect has been accomplished or if the operation cannot be completed successfully. The called entity shall not block in the implementation of procedure-based communication.

As stated before, no assumption is made as to whether the TTCN-3 test system or individual entities are implemented in a single executable or process or whether they are distributed among different processes or even test devices.

A TCI implementation shall fulfil the above mentioned requirements.

7 TTCN-3 control interface and operations

This clause defines a set of abstract data types used to represent data communicated between the TE and the TMC. In addition, it defines TCI operations in terms of their signatures, when they are to be used and what their effects on the TTCN-3 test system are.

This definition also includes a more detailed description of the input parameters required for each TCI operation call and its return value.

7.1 Overview of the TCI

The TCI defines the interaction between the TTCN-3 Executable (TE), Component Handling (CH), the Test Management (TM), the Coding/Decoding (CD), the Test Logging (TL) entities within a TTCN-3 test system. It provides means for the TE to:

- manage test execution;
- distribute execution of test components among different test devices;
- encode and decode test data; and
- logging of information about test execution.

The TCI consists of four sub-interfaces:

- **TCI Test Management Interface (TCI-TM):** This interface includes all operations needed to manage test execution, provide module parameters and external constants and provide test event logging.
- **TCI Component Handling Interface (TCI-CH):** This interface consists of operations needed to implement the management of, and communication between TTCN-3 test components in a centralized or distributed test system. It includes operations to create, start and stop test components, establish connection between TTCN-3 components, manage test components and their verdicts, and handle message and procedure based communication between TTCN-3 components.
- **TCI Coding/Decoding Interface (TCI-CD):** This interface includes all operations needed to retrieve and access codecs, i.e. encoders or decoders, for encoding data to be sent, defined using the TTCN-3 encode attribute, and to decode received data.
- **TLI Test Logging Interface (TCI-TL):** This interface includes all operations needed to retrieve information about test execution and to control the level of detail of this information.

All interfaces are bi-directional so that calling and called parts reside in the TE and in the TMC of the test system. The provided interfaces (those operations which an interface offers to the TE) and the required operations (those operation which an interface needs to use from the TE) are combined into the respective provided and required subinterface for each interface, i.e. TCI-TM Provided/ TCI-TM Required, TCI-CH Provided/ TCI-CH Required, TCI-CD Provided/ TCI-CD Required, and TCI-TL Provided/TCI-TL Required.

7.1.1 Correlation between TTCN-3 and TCI operation invocations

For some TTCN-3 operation invocations, there is a direct correlation to a TCI operation invocation, which is shown in table 1. Some of the TTCN-3 operations correlate to a pair of TCI operation request and TCI operation to implement the propagation of TTCN-3 operations through the test system. For the other TCI operation invocations there is an indirect correlation - they are needed to implement the TTCN-3 semantics of underlying concepts.

The correlation shown for TTCN-3 communication operations (i.e. `send`, `call`, `reply`, and `raise`) only holds if these operations are invoked on a test component port connected to another test component port. The correlation for communication operations that are invoked on test component ports that are mapped to test system interface ports is defined in ES 201 873-5 [3].

Table 1: Correlation between TTCN-3 and TCI operation invocations

TTCN-3 Operation Name	TCI Operation Name	TCI Interface Name
`send`	`tciSendConnected (see note 1)`	TCI-CH Provided
	`tciSendConnectedBC (see note 2)`	
	`tciSendConnectedMC (see note 3)`	
	`tciEnqueueMsgConnected`	TCI-CH Required
`call`	`tciCallConnected (see note 1)`	TCI-CH Provided
	`tciCallConnectedBC (see note 2)`	
	`tciCallConnectedMC (see note 3)`	
	`tciEnqueueCallConnected`	TCI-CH Required
`reply`	`tciReplyConnected (see note 1)`	TCI-CH Provided
	`tciReplyConnectedBC (see note 2)`	
	`tciReplyConnectedMC (see note 3)`	
	`tciEnqueueReplyConnected`	TCI-CH Required
`raise`	`tciRaiseConnected (see note 1)`	TCI-CH Provided
	`tciRaiseConnectedBC (see note 2)`	
	`tciRaiseConnectedMC (see note 3)`	
	`tciEnqueueRaiseConnected`	TCI-CH Required
`create`	`tciCreateTestComponentReq`	TCI-CH Provided
	`tciCreateTestComponent`	TCI-CH Required
`start (a component)`	`tciStartTestComponentReq`	TCI-CH Provided
	`tciStartTestComponent`	TCI-CH Required
`stop (a component)`	`tciStopTestComponentReq`	TCI-CH Provided
	`tciStopTestComponent`	TCI-CH Required
`kill`	`tciKillTestComponentReq`	TCI-CH Provided
	`tciKillTestComponent`	TCI-CH Required

TTCN-3 Operation Name	TCI Operation Name	TCI Interface Name
connect	tciConnectReq	TCI-CH Provided
	tciConnect	TCI-CH Required
disconnect	tciDisconnectReq	TCI-CH Provided
	tciDisconnect	TCI-CH Required
map	tciMapReq	TCI-CH Provided
	tciMap	TCI-CH Required
unmap	tciUnmapReq	TCI-CH Provided
	tciUnmap	TCI-CH Required
running	tciTestComponentRunningReq	TCI-CH Provided
	tciTestComponentRunning	TCI-CH Required
alive	tciTestComponentAliveReq	TCI-CH Provided
	tciTestComponentAlive	TCI-CH Required
done	tciTestComponentDoneReq	TCI-CH Provided
	tciTestComponentDone	TCI-CH Required
killed	tciTestComponentKilledReq	TCI-CH Provided
	tciTestComponentKilled	TCI-CH Required
mtc	tciGetMTCReq	TCI-CH Provided
	tciGetMTC	TCI-CH Required
execute	tciTestCaseExecuteReq	TCI-CH Provided
	tciTestCaseExecute	TCI-CH Required
log	tliLog	TCI-TL Provided
NOTE 1: For unicast communication. NOTE 2: For broadcast communication. NOTE 3: For multicast communication.		

7.2 TCI data

The TCI specification defines a set of abstract data types. These describe, at a very high level, which kind of data shall be passed from a calling to a called entity. The abstract data types are used to determine:

- how TTCN-3 data is passed from a TE to an encoder, to encode TTCN-3 value representations into a bitstring; and in the reverse case;
- how data passed from a decoder to the TE shall be decoded from a bitstring into its TTCN-3 value representation.

For these abstract data types a set of operations is defined to process the data by the coder/decoder.

The concrete representation of these abstract data types as well as the definition of basic data types like `string` and `boolean` are defined in the respective language mappings in clauses 8, 9, and 9.7.

Notice that the values for any identifier data type shall be unique in the test system implementation where uniqueness is defined as being globally distinct at any point in time. This guarantees that different objects, e.g. two timers, are identified by different identifiers and identifiers are not reused.

7.2.1 General abstract data types

The following abstract data types are defined and used for the definition of TCI operations.

7.2.1.1 Management

`TciModuleIdType` A value of `TciModuleIdType` is the name of a TTCN-3 module as specified in the TTCN-3 ATS. This abstract type is used for module handling.

`TciModuleParameterIdType` A value of `TciModuleParameterIdType` is the qualified name of a TTCN-3 module parameter as specified in the TTCN-3 ATS. This abstract type is used for module parameter handling.

`TciTestCaseIdType` A value of `TciTestCaseIdType` is the qualified name of a TTCN-3 testcase as specified in the TTCN-3 ATS. This abstract type is used for testcase handling.

TciModuleIdListType	A value of type TciModuleIdListType is a list of TciModuleIdType. This abstract type is used when retrieving the list of modules which are imported by a TTCN-3 module.
TciModuleParameterType	A value of type TciModuleParameterType is a structure of TciModuleParameterIdType and Value. This abstract type is used to represent the parameter name and the default value of a module parameter.
TciModuleParameterListType	A value of type TciModuleParameterListType is a list of TciModuleParameterType. This abstract type is used when retrieving the module parameters of a TTCN-3 module.
TciParameterType	A value of type TciParameterType includes a TTCN-3 Value, which can be absent, and a value of TciParameterPassingModeType to represent the parameter passing mode specified for the parameter in the TTCN-3 ATS.
TciParameterPassingModeType	A value of type TciParameterPassingModeType is either IN, INOUT, or OUT. This abstract type is used when starting a test case or when the termination of a test case is indicated.
TciParameterListType	A value of type TciParameterListType is a list of TciParameterType. This abstract type is used when starting a test case or when the termination of a test case is indicated.
TciParameterTypeType	A value of type TciParameterTypeType is a structure of Type and TciParameterPassingModeType. This abstract type is used to represent the type and the parameter passing mode of a test case parameter.
TciParameterTypeListType	A value of type TciParameterTypeListType is a list of TciParameterTypeType. This abstract type is used to represent the list of parameters of a test case.
TciTestComponentKindType	A value of type TciTestComponentKindType is a literal of the set of kinds of TTCN-3 test components, i.e. CONTROL, MTC, PTC, SYSTEM, and PTC_ALIVE. This abstract type is used for component handling.
TciTypeClassType	A value of type TciTypeClassType is a literal of the set of type classes in TTCN-3 such as boolean, float, record, etc. This abstract type is used for value handling.

7.2.1.2 Communication

TciBehaviourIdType	A value of type TciBehaviourIdType identifies a TTCN-3 behaviour functions.

Additional abstract data types with the prefix Tri are taken from ES 201 873-5 [3]: TriPortIdType, TriPortIdListType, TriComponentIdType, TriComponentIdListType, TriAddressType, TriAddressListType, and TriMessageType.

7.2.2 Abstract TTCN-3 data types and values

This clause defines the set of abstract data types that build up the TTCN-3 type and value representation. Functionality of each data type is defined by an accompanying set of operations. Operations on or using this abstract data type return either a value of this abstract type or a basic type like boolean.

All operations have been defined using the Interface Description Language (IDL). Concrete language mappings for the operations on the abstract data types are given in clauses 8, 9, and 9.7. In certain languages, the application of an operation on an abstract data type is represented by passing (either by-value or by-reference, depending on the mapping) the concrete value as a parameter to the operation. Other languages might choose other referencing method to the concrete value, e.g. by considering the value as an object on which a method corresponding to the operation is invoked. To indicate the inability to perform a certain task or to indicate the absence of an optional parameter in the following, the distinct value `null` is used. It can be considered as being a reserved value indicating a special value. The language mappings will define a concrete representation of this distinct value `null`.

The abstract TTCN-3 type and value representation consists of two parts:

- an abstract data type `Type` that represents all TTCN-3 types in a TTCN-3 module;
- different abstract data types that represent TTCN-3 values, i.e. TTCN-3 values of a given TTCN-3 type. This can be either values of TTCN-3 predefined types or of TTCN-3 user-defined types.

For accessing, evaluating, and coding the TTCN-3 data the test system uses the abstract data type `Type` and the different abstract value data types. Therefore, these abstract data types define the abstraction level between the TTCN-3 Executable (TE) and the remaining test system using the TCI interfaces.

7.2.2.1 Abstract TTCN-3 data types

According to the present document TTCN-3 types, either predefined or user-defined, will be represented at the TCI interfaces using the abstract data type `Type`.

For the abstract data type `Type` a set of operations is defined to:

- reference predefined and user-defined TTCN-3 data types; and
- create and maintain TTCN-3 values.

The following operations are defined for the abstract data type `Type`:

`TciModuleIdType getDefiningModule()`	Returns the module identifier of the module in which type is defined. Returns the distinct value `null` if type is a TTCN-3 base type, e.g. boolean, integer, etc.).
`TString getName()`	Returns the name of the type as defined in the TTCN-3 module.
`TciTypeClassType getTypeClass()`	Returns the type class of the respective type. A value of `TciTypeClassType` can have one of the following constants: `ADDRESS, ANYTYPE, ARRAY, BITSTRING, BOOLEAN, CHARSTRING, COMPONENT, ENUMERATED, FLOAT, HEXSTRING, INTEGER, OCTETSTRING, RECORD, RECORD_OF, SET, SET_OF, UNION, UNIVERSAL_CHARSTRING, VERDICT.`
`Value newInstance()`	Returns a freshly created value of the given type. This initial value of the created value is undefined.

NOTE: Newly created instances of empty record types are considered to be initialized.

`TString getTypeEncoding()`	Returns the type encoding attribute as defined in the TTCN-3 module.
`TString getTypeEncodingVariant()`	This operation returns the value encoding variant attribute as defined in TTCN-3, if any. If no encoding variant attribute is defined the distinct value `null` is returned.
`TStringseq getTypeExtension()`	Returns the type extension attribute as defined in the TTCN-3 module.

7.2.2.2 Abstract TTCN-3 values

According to the present document, TTCN-3 values are represented at the TCI interfaces via numerous abstract data types.

Figure 4 presents the hierarchy between the abstract data types for TTCN-3 values (short: abstract values).

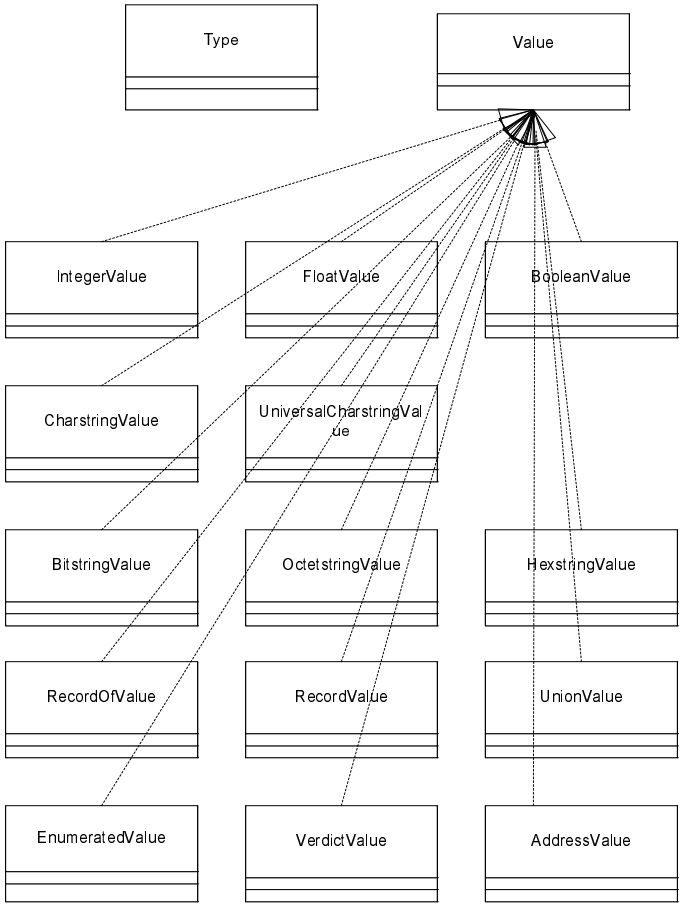

Figure 4: Hierarchy of abstract values

As shown in figure 4, all TTCN-3 abstract values share the same base abstract data type `Value`. All operations defined on this common base data type are implicitly defined also for the abstract value types derived from it.

7.2.2.2.1 The abstract data type `Value`

The following operations are defined on the base abstract data type `Value`. The concrete representations of these operations are defined in the respective language mapping sections:

`Type getType()`	Returns the type of the specified value.
`TBoolean notPresent()`	Returns `true` if the specified value is `omit`, `false` otherwise.
`TString getValueEncoding()`	Returns the value encoding attribute as defined in TTCN-3, if any. If no encoding attribute is defined the distinct value `null` is returned.
`TString getValueEncodingVariant()`	Returns the value encoding variant attribute as defined in TTCN-3, if any. If no encoding variant attribute is defined the distinct value `null` is returned.

7.2.2.2.2 The abstract data type `IntegerValue`

The abstract data type `IntegerValue` is based on the abstract data type `Value`. It represents TTCN-3 `integer` values.

The following operations are defined on the abstract data type `IntegerValue`:

`TInteger getInt()`	Returns the integer value of this TTCN-3 integer.
`void setInt(in TInteger value)`	Sets this `IntegerValue` to `value`.

7.2.2.2.3 The abstract data type `FloatValue`

The abstract data type `FloatValue` is based on the abstract data type `Value`. It represents TTCN-3 `float` values.

The following operations are defined on the abstract data type `FloatValue`:

`TFloat getFloat()`	Returns the float value of this TTCN-3 float.
`void setFloat(in TFloat value)`	Sets this `FloatValue` to value.

7.2.2.2.4 The abstract data type `BooleanValue`

The abstract data type `BooleanValue` is based on the abstract data type `Value`. It represents TTCN-3 `boolean` values.

The following operations are defined on the abstract data type `FloatValue`:

`TBoolean getBoolean ()`	Returns the boolean value of the TTCN-3 `boolean`.
`void setBoolean(in TBoolean value)`	Sets this boolean value to `value`.

7.2.2.2.5 The abstract data type `CharstringValue`

The abstract data type `CharstringValue` is based on the abstract data type `Value`. It represents TTCN-3 `charstring` values. `TChar` is a character within a charstring value.

The following operations are defined on the abstract data type `CharstringValue`:

`TString getString()`	Returns the string value of the TTCN-3 `charstring`. The textual representation of the empty TTCN-3 `charstring` is `''`, while its length is zero.
`void setString(in TString value)`	Sets this `CharstringValue` to `value`.
`TChar getChar(in TInteger position)`	Returns the char value of the TTCN-3 charstring at `position`. Position 0 denotes the first char of the TTCN-3 `charstring`. Valid values for position are from `0` to `length - 1`.
`void setChar(in TInteger position, in TChar value)`	Set the character at position to value. Valid values for position are from `0 to length - 1`.
`TInteger getLength()`	Returns the length of this CharstringValue in chars, zero if the value of this CharstringValue is omit.
`void setLength(in TInteger len)`	setLength first resets this CharstringValue to its initial value and afterwards sets the length of this `CharstringValue` in chars to `len`.

7.2.2.2.6 The abstract data type `UniversalCharstringValue`

The abstract data type `UniversalCharstringValue` is based on the abstract data type `Value`. It represents TTCN-3 `universal charstring` values. `TUniversalChar` is a character within a universal charstring value.

The following operations are defined on the abstract data type `UniversalCharstringValue`:

`TString getString()`	Returns the textual representation of this `UniversalCharstringValue`, as defined in TTCN-3.
`void setString(in TString value)`	Sets the value of this `UniversalCharstringValue` according to the textual representation as defined by `value`.
`TUniversalChar getChar(in TInteger position)`	Returns the universal char value of the TTCN-3 `universal charstring` at position. Position 0 denotes the first `TUniversalChar` of the TTCN-3 `universal charstring`. Valid values for `position` are from `0 to length - 1`.
`void setChar(in TInteger position, in TUniversalChar value)`	Sets the universal char at position to value. Valid values for `position` are from `0 to length - 1`.
`TInteger getLength()`	Returns the length of this universal charstring value in universal chars, zero if the value of this universal charstring value is omit.
`void setLength(in TInteger len)`	setLength first resets this UniversalCharstringValue to its initial value and afterwards sets the length of this `UniversalCharstringValue` in universal chars to `len`.

7.2.2.2.7 The abstract data type `BitstringValue`

The abstract data type `BitstringValue` is based on the abstract data type `Value`. It represents TTCN-3 `bitstring` values:

The following operations are defined on the abstract data type `BitstringValue`.

`TString getString()`	Returns the textual representation of this `BitstringValue`, as defined in TTCN-3. E.g. the textual representation of `0101` is `"0101"B`. The textual representation of the empty TTCN-3 `bitstring` is `""B`, while its length is zero.
`void setString(in TString value)`	Sets the value of this `BitstringValue` according to the textual representation as defined by `value`. E.g. the value of this `BitstringValue` is `0101` if the textual representation in `value` is `"0101"B`.
`TChar getBit(in TInteger position)`	Returns the value `(0 | 1)` at position of this TTCN-3 bitstring as a character. Position 0 denotes the first bit of the TTCN-3 bitstring. Valid values for position are from `0 to length - 1`.
`void setBit(in TInteger position, in TInteger value)`	Sets the bit at position to the value `(0 | 1)`. Position 0 denotes the first bit in this BitstringValue. Valid values for position are from `0 to length - 1`.
`TInteger getLength()`	Returns the length of this `BitstringValue` in bits, zero if the value of this `BitstringValue` is `omit`.
`void setLength(in TInteger len)`	setLength first resets this BitstringValue to its initial value and afterwards sets the length of this `BitstringValue` in bits to `len`.

7.2.2.2.8 The abstract data type `OctetstringValue`

The abstract data type `OctetstringValue` is based on the abstract data type `Value`. It represents TTCN-3 `octetstring` values.

The following operations are defined on the abstract data type `OctetstringValue`:

`TString getString()`	Returns the textual representation of this `OctetstringValue`, as defined in TTCN-3. E.g. the textual representation of `0xCAFFEE` is `"CAFFEE"O`. The textual representation of the empty TTCN-3 `octetstring` is `""O`, while its length is zero.
`void setString(in TString value)`	Sets the value of this `OctetstringValue` according to the textual representation as defined by `value`. E.g. The value of this `OctetstringValue` is `0xCAFFEE` if the textual representation in `value` is `"CAFFEE"O`.
`TChar getOctet(in TInteger position)`	Returns the value `(0..255)` at `position` of this TTCN-3 octetstring. Position 0 denotes the first octet of the TTCN-3 octetstring. Valid values for position are from `0 to length - 1`.
`void setOctet(in TInteger position, in TInteger value)`	Sets the octet at `position` to value `(0..255)`. Position 0 denotes the first octet in the octetstring. Valid values for position are from `0 to length - 1`.
`TInteger getLength()`	Returns the length of this `OctetstringValue` in octets, zero if the value of this `OctetstringValue` is `omit`.
`void setLength(in TInteger len)`	setLength first resets this OctetstringValue to its initial value and afterwards sets the length of this `OctetstringValue` in octets to `len`.

7.2.2.2.9 The abstract data type `HexstringValue`

The abstract data type `HexstringValue` is based on the abstract data type `Value`. It represents TTCN-3 `hexstring` values.

The following operations are defined on the abstract data type `HexstringValue`:

`TString getString()`	Returns the textual representation of this `HexstringValue`, as defined in TTCN-3. E.g. the textual representation of `0xAFFEE` is `"AFFEE"H`. The textual representation of the empty TTCN-3 `hexstring` is `""H`, while its length is zero.
`void setString(in TString value)`	Sets the value of this `HexstringValue` according to the textual representation as defined by `value`. E.g. The value of this `HexstringValue` is `0xAFFEE` if the textual representation in `value` is `"AFFEE"H`.
`TChar getHex(in TInteger position)`	Returns the value `(0..15)` at `position` of this TTCN-3 hexstring. Position 0 denotes the first hex digits of the TTCN-3 hexstring. Valid values for position are from `0 to length - 1`.
`void setHex(in TInteger position, in TInteger value)`	Sets the hex digit at position to value `(0..15)`. Position 0 denotes the first octet in the `hexstring`. Valid values for position are from `0 to length - 1`.
`TInteger getLength()`	Returns the length of this `HexstringValue` in octets, zero if the value of this `HexstringValue` is `omit`.

`void setLength(in TInteger len)` setLength first resets this `HexstringValue` to its initial value and afterwards sets the length of this `HexstringValue` in hex digits to `len`.

7.2.2.2.10 The abstract data type `RecordValue`

The abstract data type `RecordValue` is based on the abstract data type `Value`. It specifies how to get and set the TTCN-3 `record` type.

NOTE: Newly created instances of empty record types are considered to be initialized.

The same abstract data type applies for values whose type class is `SET`. The distinction between `record` and `set` is only relevant at matching time.

The following operations are defined on the abstract data type `RecordValue`:

`Value getField(in TString fieldName)` Returns the value of the field named `fieldName`. The return value is the common abstract base type `Value`, as a record field can have any type defined in TTCN-3. If the field cannot be obtained from the record the distinct value `null` is returned.

`void setField(in TString fieldName, in Value value)`
Sets the field named `fieldName` of the record to `value`. No assumption shall be made on how a field is stored in a record. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value is copied. Therefore it should be assumed that subsequent modifications of `value` will not be considered in the record.

`TStringSeq getFieldNames()` Returns a sequence of string of field names, the empty sequence, if the record has no fields.

`void setFieldOmitted(in TString fieldName)`
Mark the referenced field of the record as being omitted.

7.2.2.2.11 The abstract data type `RecordOfValue`

The abstract data type `RecordOfValue` is based on the abstract data type `Value`. It specifies how to get and set elements in TTCN-3 `record of` types. The same abstract data type applies for value whose type class is ARRAY or `SET_OF`. The distinction between `record of`, `set of`, and `array` is only relevant at matching time.

The following operations are defined on the abstract data type `RecordOfValue`:

`Value getField(in TInteger position)` Returns the value of the `record of` at `position` if `position` is between `zero` and `length -1`, the distinct value `null` otherwise. Also for `array` values indices start from 0, independent of the lower index bound. The return value is the common abstract base type `Value`, as a `record of` can have fields of any type defined in TTCN-3.

`void setField(in TInteger position, in Value value)`
Sets the field at `position` to `value`. If `position` is greater than `(length -1)` the record of is extended to have the length `(position + 1)`. The `record of` elements between the original position at `length` and `position - 1` is set to `omit`. No assumption shall be made on how a field is stored in a `record of`. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value is copied. Therefore, it should be assumed that subsequent modifications of `value` will not be considered in the `record of`. Also for `array` values indices start from 0, independent of the lower index bound.

`void appendField(in Value value)` Appends the value at the end of the `record of`, i.e. at position `length`. No assumption shall be made on how a field is stored in a `record of`. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value is copied. Therefore, it should be assumed that subsequent modifications of `value` will not be considered in the `record of`.

`Type getElementType()` Returns the `Type` of the elements of this `record of`.

`TInteger getLength()` Returns the actual length of the `record of` value, zero if the `record of` value is `omit`.

`void setLength(in TInteger len)` Sets the length of the `record of` to `len`. If `len` is greater than the original length, newly created elements have the value `omit`. If `len` is less or equal than the original length this operation is ignored.

`TInteger getOffset()` Returns the lowest possible index. For a `record of` or `set of` value this is always `0`. For an `array` value, this is the lower index bound used in the type definition.

7.2.2.2.12 The abstract data type `UnionValue`

The abstract data type `UnionValue` is based on the abstract data type `Value`. It specifies how to get and set variants in a TTCN-3 `union` type. The TTCN-3 `anytype` is represented by a `UnionValue` where the type class of the type obtained by `getType()` is `ANYTYPE`. For details on type classes see clause 7.2.2.1.

The following operations are defined on the abstract data type `UnionValue`:

`Value getVariant(in TString variantName)` Returns the value of the TTCN-3 union `variantName`, if `variantName` equals the result of `getPresentVariantName`, the distinct value `null` otherwise. `variantName` denotes the name of the union variant as defined in TTCN-3.

`void setVariant(in TString variantName, in Value value)` Sets `variantName` of the union to value. If `variantName` is not defined for this union this operation is ignored. If another variant was selected the new variant is selected instead.

`TString getPresentVariantName()` Returns a String representing the currently selected variant name in the given TTCN-3 union. The distinct value `null` is returned if no variant is selected.

`TStringSeq getVariantNames()` Returns a sequence of string of variant names, the distinct value `null`, if the union has no fields. If the `UnionValue` represents the TTCN-3 `anytype`, i.e. the type class of the type obtained by getType() is ANYTYPE, all predefined and user-defined TTCN-3 types is returned.

7.2.2.2.13 The abstract data type `EnumeratedValue`

The abstract data type `EnumeratedValue` is based on the abstract data type `Value`. It specifies how TTCN-3 `enumerated` can be set and get.

The following operations are defined on the abstract data type `EnumeratedValue`:

`TString getEnum()` Returns the string identifier of this `EnumeratedValue`. This identifier equals the identifier in the TTCN-3 specification.

`void setEnum(in TString enumValue)` Sets the enum to `enumValue`. If `enumValue` is not an allowed value for this enumeration the operation is ignored.

7.2.2.2.14 The abstract data type VerdictValue

The abstract data type VerdictValue is based on the abstract data type Value. It specifies how TTCN-3 verdict can be set and get.

The following operations are defined on the abstract data type VerdictValue:

TInteger getVerdict()	Returns the integer value for this VerdictValue. The integer is one of the following constants: ERROR, FAIL, INCONC, NONE, PASS.
void setVerdict(in TInteger verdict)	Sets this VerdictValue to verdict. Note that a VerdictValue can be set to any of the above mentioned verdicts at any time. The VerdictValue does not perform any verdict calculations as defined in TTCN-3. For example, it is legal to set the VerdictValue first to ERROR and then to PASS.

7.2.2.2.15 The abstract data type AddressValue

The following operations are defined on the base abstract data type AddressValue. The concrete representations of these operations are defined in the respective language mapping sections:

Value getAddress()	Returns the address value, which will no longer be of type class ADDRESS but rather of the actual type used for address.
void setAddress(in Value value)	Sets this address value to value.

7.2.3 Abstract logging types

7.2.3.1 The abstract data type TciValueTemplate

The following operations are defined on the abstract data type TciValueTemplate. The concrete representations of these operations are defined in the respective language mapping sections:

TBoolean isOmit()	Returns true if the template is an omit template.
TBoolean isAny()	Returns true if the template is an any template.
TBoolean isAnyOrOmit()	Returns true if the template is an any or omit template.
TString getTemplateDef()	Returns the definition of that template.

7.2.3.2 The abstract data type TciNonValueTemplate

The following operations are defined on the abstract data type TciNonValueTemplate. The concrete representations of these operations are defined in the respective language mapping sections:

TBoolean isAny()	Returns true if the template is an any template.
TBoolean isAll()	Returns true if the template is an all template.
TString getTemplateDef()	Returns the definition of that template.

7.2.3.3 The Value List and Mismatch Types

The following abstract data types are defined and used for the logging of differences between values and templates:

TciValueList	A value of TciValueList is a list of values.
TciValueDifference	A value of TciValueDifference is a structure containing a value, a template, and a description for the reason of this difference.

`TciValueDifferenceList`	A value of `TciValueDifferenceList` is a sequence of value differences.

The following operations are defined on the abstract data type `TciValueList`. The concrete representations of these operations are defined in the respective language mapping sections:

`TInteger size()`	Returns the number of values in this list.
`TBoolean isEmpty()`	Returns `true` if this list contains no values.
`Value get(in TInteger index)`	Returns the value at the specified position.

The following operations are defined on the abstract data type `TciValueDifference`. The concrete representations of these operations are defined in the respective language mapping sections:

`Value getValue()`	Returns the value of the TciValueDifference.
`TciValueTemplate getTciValueTemplate()`	Returns the template of the TciValueDifference.
`String getDescription()`	Returns the description of the mismatch.

The following operations are defined on the abstract data type `TciValueDifferenceList`. The concrete representations of these operations are defined in the respective language mapping sections:

`TInteger size()`	Returns the number of values in the list.
`TBoolean isEmpty()`	Returns `true` if the list contains no values.
`TciValueDifference get(in TInteger index)`	Returns the TciValueDifference at the specified position.

7.2.3.4 The Status Types

The following abstract data types are defined and used for the logging of component and timer status:

`ComponentStatusType`	A value of `ComponentStatusType` is either "inactiveC", "runningC", "stoppedC", or "killedC".
`TimerStatusType`	A value of `TimerStatusType` is either "runningT", "inactiveT", or "expiredT".
`PortStatusType`	A value of `PortStatusType` is either "startedP", "haltedP", or "stoppedP".

7.3 TCI operations

This clause specifies the operations that a TTCN-3 Executable shall provide to a test system (*required operations*) and which functionality shall be provided by the test system to the TTCN-3 Executable (*provided operations*).

The terms "required" and "provided" reflect the fact that the present document defines the requirements on a TTCN-3 Executable from a user's point of view. The user "requires" from a TTCN-3 Executable certain functionality to build a complete TTCN-3-based test system. To fulfil its task the TTCN-3 Executable has to inform the user on certain events where the user has to "provide" this possibility to the TTCN-3 Executable.

All operation definitions in this clause are defined using the Interface Definition Language (IDL). Concrete language mappings are defined in clauses 8, 9, and 9.7. Annex B provides for the logging interface an alternative mapping to XML.

For every TCI operation call all *in*, *inout*, and *out* parameters listed in the particular operation definition are mandatory. The value of an *in* parameter is specified by the calling entity. Calling entity refers to the direction of the call. For operations on a *required* interface the calling entity is the test system while the called entity is the TTCN-3 Executable. For operations on a *provided* interface the calling entity is the TTCN-3 Executable while the test system is the called entity.

Similarly, the value of an *out* parameter is specified by the called entity. In the case of an *inout* parameter, a value is first specified by the calling entity but may be replaced with a new value by the called entity. Note that although TTCN-3 also uses *in*, *inout*, and *out* for signature definitions the denotations used in TCI IDL specification are not related to those in a TTCN-3 specification.

Operation calls should use a reserved value to indicate the absence of parameters. The reserved values for these types are defined in each language mapping and will be subsequently referred to as the `null` value.

In addition, the `null` value will also be used to indicate the inability to perform a certain task.

As this clause specifies interfaces only and does not suggest concrete implementations on how to perform the specified functionality the term entity will be used to identify the part of the test system implementation that implements this interface and performs the requested functionality. For example, the calling entity in the tciSendConnected operation is the TE, i.e. the part of test system implementation that provides the TE functionality.

All functions in the interface are described using the following template. Descriptions that are not applicable for certain operations are removed.

Signature	`IDL Signature`
In Parameters	Description of data passed as parameters to the operation from the calling entity to the called entity.
Out Parameters	Description of data passed as parameters to the operation from the called entity to the calling entity.
InOut Parameters	Description of data passed as parameters to the operation from the calling entity to the called entity and from the called entity back to the calling entity.
Return Value	Description of data returned from the operation to the calling entity.
Constraint	Description of any constraints when the operation can be called.
Effect	Behaviour required of the called entity before the operation may return.

7.3.1 The TCI-TM interface

The TCI Test Management Interface (TCI-TM) describes the operations a TTCN-3 Executable is required to implement and the operations a test management implementation shall provide to the TE (figure 5).

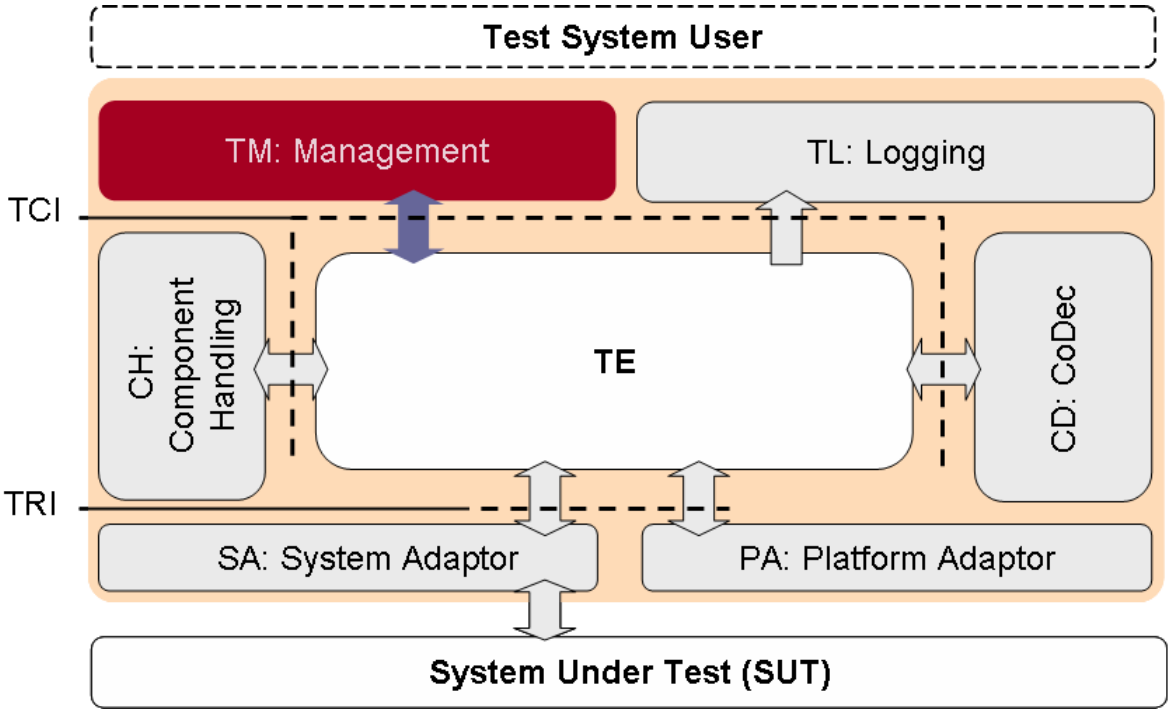

Figure 5: The TCI-TM interface

A test management implementation provides overall test management to the test system user. It requires from the TE the presence of operations to start and stop test execution of a TTCN-3 module or of certain test cases in a TTCN-3 module. In turn it provides operations to the TE for resolving module parameter at runtime and the indication of execution termination.

Clause 12 illustrates the usage and sequential ordering of operation calls by either the TE or the test management.

7.3.1.1 TCI-TM required

This clause specifies the operations the TM requires from the TE. In addition to the operations specified in this clause, a test management requires the operations as required at the TCI-CD interface.

7.3.1.1.1 tciRootModule

Signature	`void tciRootModule (in TciModuleIdType moduleName)`	
In Parameters	`moduleName`	The `moduleName` denotes the module identifiers as defined in TTCN-3.
Return Value	`void`	
Constraint	Shall be used only if neither the control part nor a test case is currently being executed.	
Effect	`tciRootModule` selects the indicated module for execution through a subsequent call using `tciStartTestCase` or `tciStartControl`. A `tciError` will be issued by the TE if no such module exists.	

7.3.1.1.2 tciGetImportedModules

Signature	`TciModuleIdListType tciGetImportedModules()`
Return Value	A list of all imported modules of the root module. The modules are ordered as they appear in the TTCN-3 module. If no imported modules exist, an empty module list is returned.
Constraint	Shall be used only if a root module has been set before.
Effect	The TE provides to the management a list of imported modules of the root module. If no imported module exists, an empty module list is returned. If the TE cannot provide a list, the distinct `null` value shall be returned.

7.3.1.1.3 tciGetModuleParameters

Signature	`TciModuleParameterListType tciGetModuleParameters (in TciModuleIdType moduleName)`	
In Parameters	`moduleName`	The `moduleName` denotes the module identifiers for which the module parameters should be retrieved.
Return Value	A list of all module parameters of the identified module. The parameters are ordered as they appear in the TTCN-3 module. If no parameters exist, an empty module parameter list is returned.	
Constraint	Shall be used only if a root module has been set before.	
Effect	The TE provides to the management a list of module parameters of the identified module. If no module parameters exist, an empty module parameter list is returned. If the TE cannot provide a list, the distinct `null` value shall be returned.	

7.3.1.1.4 tciGetTestCases

Signature	`TciTestCaseIdListType tciGetTestCases ()`
Return Value	A list of all test cases that are either defined in or imported into the root module.
Constraint	Shall be used only if a root module has been set before.
Effect	The TE provides to the management a list of test cases. If no test cases exist, an empty test case list is returned. If the TE cannot provide a list, the distinct `null` value shall be returned.

7.3.1.1.5 tciGetTestCaseParameters

Signature	`TciParameterTypeListType tciGetTestCaseParameters (in TciTestCaseIdType testCaseId)`	
In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
Return Value	A list of all parameter types of the given test case. The parameter types are ordered as they appear in the TTCN-3 signature of the test case. If no parameters exist, an empty parameter type list is returned.	
Constraint	Shall be used only if a root module has been set before.	
Effect	The TE provides to the management a list of parameter types of the given test case. If no test case parameters exist, an empty parameter type list is returned. If the TE cannot provide a list, the distinct `null` value shall be returned.	

7.3.1.1.6 tciGetTestCaseTSI

Signature	`TriPortIdListType tciGetTestCaseTSI (in TciTestCaseIdType testCaseId)`	
In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
Return Value	A list of all system ports of the given test case that have been declared in the definition of the system component for the test case, i.e. the TSI ports. If a system component has not been explicitly defined for the test case, then the list contains all communication ports of the MTC test component. The ports are ordered as they appear in the respective TTCN-3 component type declaration. If no system ports exist, an empty list, i.e. a list of length zero is returned.	
Constraint	Shall be used only if a root module has been set before.	
Effect	The TE provides to the management a list of system ports of the given test case. If no system ports exist, an empty port list is returned. If the TE cannot provide a list, the distinct `null` value shall be returned.	

7.3.1.1.7 tciStartTestCase

Signature	`void tciStartTestCase(in TciTestCaseIdType testCaseId, in TciParameterListType parameterList)`	
In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
	`parameterList`	A list of `Values` where each value defines a parameter from the parameter list as defined in the TTCN-3 test case definition. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature of the test case. If no parameters have to be passed either the `null` value or an empty `parameterList`, i.e. a list of length zero shall be passed.
Return Value	`void`	
Constraint	Shall be called only if a module has been selected before. Only `testCaseIds` for test cases that are declared in the currently selected TTCN-3 module shall be passed. Test cases that are imported in a referenced module cannot be started. To start imported test cases the referenced (imported) module must be selected first using the `tciRootModule` operation.	
Effect	`tciStartTestCase` starts a testcase in the currently selected module with the given parameters. A `tciError` will be issued by the TE if no such test case exists. All *in* and *inout* test case parameters in `parameterList` contain `Value`. All *out* test case parameters in `parameterList` shall contain the distinct value of `null` since they are only of relevance when the test case terminates.	

7.3.1.1.8 tciStopTestCase

Signature	`void tciStopTestCase()`
Return Value	`void`
Constraint	Shall be called only if a module has been selected before.
Effect	tciStopTestCase stops the testcase currently being executed. If the TE is not executing a test case, the operation will be ignored. If the control part is being executed, `tciStopTestCase` will stop execution of the currently executed test case, i.e. the execution of the test case that has recently been indicated using the *provided* operation `tciTestCaseStarted`. A possible executing control part will continue execution as if the test case has stopped normally and returned with verdict `ERROR`.

7.3.1.1.9 tciStartControl

Signature	`TriComponentId tciStartControl()`
Return Value	A `TriComponentId` that represents the test component the module control part is executed on. If the TE cannot start control part of the selected module the distinct value `null` will be returned.
Constraint	Shall be called only if a module has been selected before.
Effect	Starts the control part of the selected module. The control part will start TTCN-3 test cases as described in TTCN-3. While executing the control part the TE will call the *provided* operation `tciTestCaseStarted` and `tciTestCaseTerminated` for every test case that has been started and that has terminated. After termination of the control part the TE will call the *provided* operation `tciControlPartTerminated`.

7.3.1.1.10 tciStopControl

Signature	`void tciStopControl()`
Return Value	`void`
Constraint	Shall only be called if a module has been selected before.
Effect	`tciStopControl` stops execution of the control part. If no control part is currently being executed the operation will be ignored. If a test case has been started directly this will stop execution of the current test case as if `tciStopTestCase` has been called.

7.3.1.2 TCI-TM provided

This clause specifies the operations the TM has to provide to the TE.

7.3.1.2.1 tciTestCaseStarted

Signature	`void tciTestCaseStarted(in TciTestCaseIdType testCaseId,`
	`in TciParameterListType parameterList,`
	`in TFloat timer)`	

In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
	`parameterList`	A list of values that are part of the test case signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 test case declaration.
	`timer`	A float value representing the duration of the test case timer.
Return Value	`void`	
Constraint	Shall only be called after either the control part of the module or a test case has been started using the *required* operations `tciStartControl` or `tciStartTestCase`.	
Effect	`tciTestCaseStarted` indicates to the TM that a test case with `testCaseId` has been started. It will not be distinguished whether the test case has been started explicitly using the *required* operation `tciStartTestCase` or implicitly while executing the control part.	

7.3.1.2.2 tciTestCaseTerminated

Signature	`void tciTestCaseTerminated(in VerdictValue verdict,` `in TciParameterListType parameterList)`	
In Parameters	`verdict`	The final verdict of the test case.
	`parameterList`	A list of values that are part of the test case signature. The parameters in parameterList are ordered as they appear in the TTCN-3 test case declaration.
Return Value	`void`	
Constraint	Shall only be called after either the control part of the module or a test case has been started using the *required* operations `tciStartControl` or `tciStartTestCase`.	
Effect	This operation will be called by the TE to indicate the test management that the test case that has been currently executed on the MTC has terminated and that the final verdict was `verdict`. On the invocation of a `tciTestCaseTerminated` operation all *out* and *inout* test case parameters contain `Values`. All in test case parameters contain the distinct value of `null` because they are only of relevance to the test case start but not in the reply to the call.	

7.3.1.2.3 tciControlTerminated

Signature	`void tciControlTerminated ()`
Return Value	`void`
Constraint	Shall only be called when the module execution has been started using the `tciStartControl` operation.
Effect	This operation will be called by the TE to indicate the test management that the control part of the selected module has just terminated execution.

7.3.1.2.4 tciGetModulePar

Signature	`Value tciGetModulePar (in TciModuleParameterIdType parameterId)`	
In Parameters	`parameterId`	The identifier of the module parameter as defined in TTCN-3.
Return Value	A value.	
Constraint	This operation shall be called whenever the TE needs to access the value of a module parameter. Every accessed module parameter will be resolved only once between a `tciStartTestCase` and `tciTestCaseTerminated` pair if a test case has been started explicitly or between a `tciStartControl` and `tciControlTerminated` pair if the control part of a module has been started.	
Effect	The management provides to the TE a `Value` for the indicated `parameterId`. Every call of `tciGetModulePar()` will return the same value throughout the execution of an explicitly started test case or throughout the execution of a control part If the management cannot provide a TTCN-3 value, the distinct `null` value shall be returned.	

7.3.1.2.5 tciLog

Signature	`void tciLog (in TriComponentIdType testComponentId, in TString message)`	
In Parameters	`testComponentId`	Identifier of the component that logs the message.
	`message`	A string value, i.e. the message to be logged.
Return Value	`void`	
Constraint	Shall be called by the TE when the TTCN-3 statement log will be executed, either in the control part of a module or within the test case.	
Effect	The TM presents `testComponentId` and `message` to the user, how this done is not within the scope of the present document.	

7.3.1.2.6 tciError

Signature	`void tciError(in TString message)`	
In Parameters	`message`	A string value, i.e. the error message.
Return Value	`void`	
Constraint	Can be called at any time by the TE to indicate an unrecoverable error situation. This error situation could either be indicated by the CH or the CD or could occur within the TE.	
Effect	The TE indicates the occurrence of an unrecoverable error situation. `message` contains a reason phrase that might be communicated to the test system user. It is up to the test management to terminate execution of test cases or control parts if running. The test management has to take explicit measures to terminate test execution immediately.	

7.3.2 The TCI-CD interface

The TCI Codec Interface (TCI-CD) describes the operations a TTCN-3 Executable is required to implement and the operations a codec implementation for a certain encoding scheme shall provide to the TE (see figure 6).

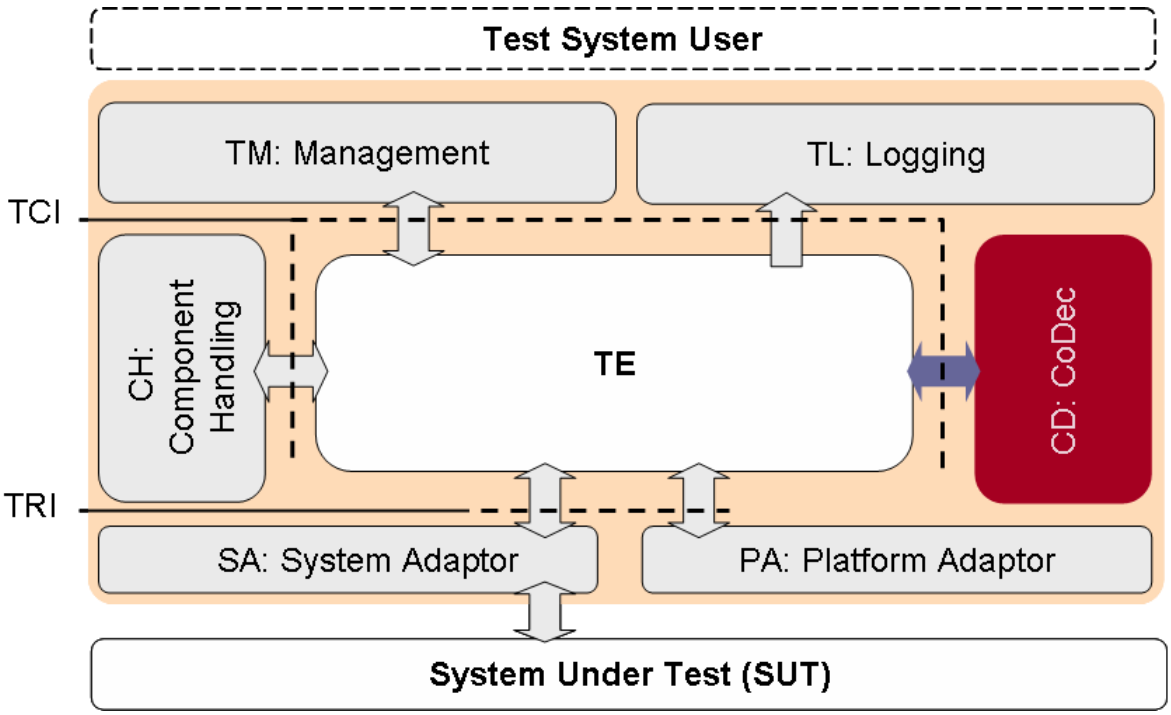

Figure 6: The TCI-CD interface

A codec implementation encodes TTCN-3 values according to the encoding attribute into a bitstring and decodes a bitstring according to decoding hypothesis. To be able to decode a bitstring into a TTCN-3 value the CD requires certain functionality from the TE. In turn the CD provides encoding and decoding functionality to the TTCN-3 Executable.

Clause 12 illustrates the usage and sequential ordering of operation calls by either the TE or the CD.

7.3.2.1 TCI-CD required

This clause specifies the operations the CD requires from the TE. All operations specified in this clause are also required at the TCI-TM and TCI-CH interfaces.

7.3.2.1.1 getTypeForName

Signature	`Type getTypeForName(in TString typeName)`	
In Parameters	`typeName`	The TTCN-3 name of the type as defined in the TTCN-3 module. The following are reserved type names and will return a predefined type: "integer" "float" "bitstring" "hexstring" "octetstring" "charstring" "universal charstring" "boolean" "verdicttype" typeName has to be the fully qualified type name, i.e. module.typeName
Return Value	A type representing the requested TTCN-3 type.	
Constraint	---	
Effect	Returns a type representing a TTCN-3 type. Predefined TTCN-3 types can be retrieved from the TE by using the TTCN-3 keywords for the predefined types. In this case `typeName` denotes to the basic TTCN-3 type like "charstring", "bitstring" etc. Returns the distinct value `null` if the requested type cannot be returned. Note that the `anytype` and `address` cannot be obtained with module set to `null`. Although they are predefined types they might be distinct between modules. For example, `address` can either be the unmodified predefined type, or a user-defined type in a module. Other predefined types cannot be redefined.	

7.3.2.1.2 getInteger

Signature	`Type getInteger()`
Return Value	An instance of `Type` representing a TTCN-3 integer type.
Effect	Constructs and returns a basic TTCN-3 integer type.

7.3.2.1.3 getFloat

Signature	`Type getFloat()`
Return Value	An instance of `Type` representing a TTCN-3 float type.
Effect	Constructs and returns a basic TTCN-3 float type.

7.3.2.1.4 getBoolean

Signature	`Type getBoolean()`
Return Value	An instance of `Type` representing a TTCN-3 boolean type.
Effect	Constructs and returns a basic TTCN-3 boolean type.

7.3.2.1.5 Void

7.3.2.1.6 getCharstring

Signature	`Type getCharstring ()`
Return Value	An instance of `Type` representing a TTCN-3 charstring type.
Effect	Constructs and returns a basic TTCN-3 charstringtype.

7.3.2.1.7 getUniversalCharstring

Signature	`Type getUniversalCharstring ()`
Return Value	An instance of `Type` representing a TTCN-3 universal charstring type.
Effect	Constructs and returns a basic TTCN-3 universal charstring type.

7.3.2.1.8 getHexstring

Signature	`Type getHexstring ()`
Return Value	An instance of `Type` representing a TTCN-3 hexstring type.
Effect	Constructs and returns a basic TTCN-3 hexstring type.

7.3.2.1.9 getBitstring

Signature	`Type getBitstring()`
Return Value	An instance of `Type` representing a TTCN-3 bitstring type.
Effect	Constructs and returns a basic TTCN-3 bitstring type.

7.3.2.1.10 getOctetstring

Signature	`Type getOctetstring ()`
Return Value	An instance of `Type` representing a TTCN-3 octetstring type.
Effect	Constructs and returns a basic TTCN-3 octetstring type.

7.3.2.1.11 getVerdict

Signature	`Type getVerdict()`
Return Value	An instance of `Type` representing a TTCN-3 verdict type.
Effect	Constructs and returns a basic TTCN-3 verdict type.

7.3.2.1.12 tciErrorReq

Signature	`void tciErrorReq(in TString message)`	
In Parameters	`Message`	A string value, i.e. the error phrase describing the problem.
Return Value	`void`	
Constraint	Shall be called whenever an error situation has occurred.	
Effect	The TE will be notified about an unrecoverable error situation within the CD and forward the error indication to the test management.	

7.3.2.2 TCI-CD provided

This clause specifies the operations the TM shall provide to the TE.

7.3.2.2.1 decode

Signature	`Value decode(in TriMessageType message, in Type decodingHypothesis)`	
In Parameters	`message`	The encoded message to be decoded.
	`decodingHypothesis`	The hypothesis the decoding can be based on.
Return Value	Returns the decoded value, if the value is of a compatible type as the `decodingHypothesis`, else the distinct value `null`.	
Constraint	This operation shall be called whenever the TE has to decode an encoded value. The TE might decode immediately after reception of an encoded value, or might for performance considerations postpone the decoding until the actual access of the encoded value.	
Effect	This operation decodes `message` according to the encoding rules and returns a TTCN-3 value. The `decodingHypothesis` shall be used to determine whether the encoded value can be decoded. If an encoding rule is not self-sufficient, i.e. if the encoded message does not inherently contain its type `decodingHypothesis` shall be used. If the encoded value can be decoded without the decoding hypothesis, the distinct `null` value shall be returned if the type determined from the encoded message is not compatible with the decoding hypothesis.	

7.3.2.2.2 encode

Signature	`TriMessageType encode(in Value value)`	
In Parameters	`value`	The value to be encoded.
Return Value	Returns an encoded `TriMessage` for the specified encoding rule.	
Constraint	This operation shall be called whenever the TE has to encode a Value.	
Effect	Returns an encoded `TriMessage` according to the encoding rules.	

7.3.3 The TCI-CH interface

The TCI Component Handling Interface (TCI-CH) describes the operations a TTCN-3 Executable is required to implement and the operations a component handling implementation shall provide to the TE (figure 7).

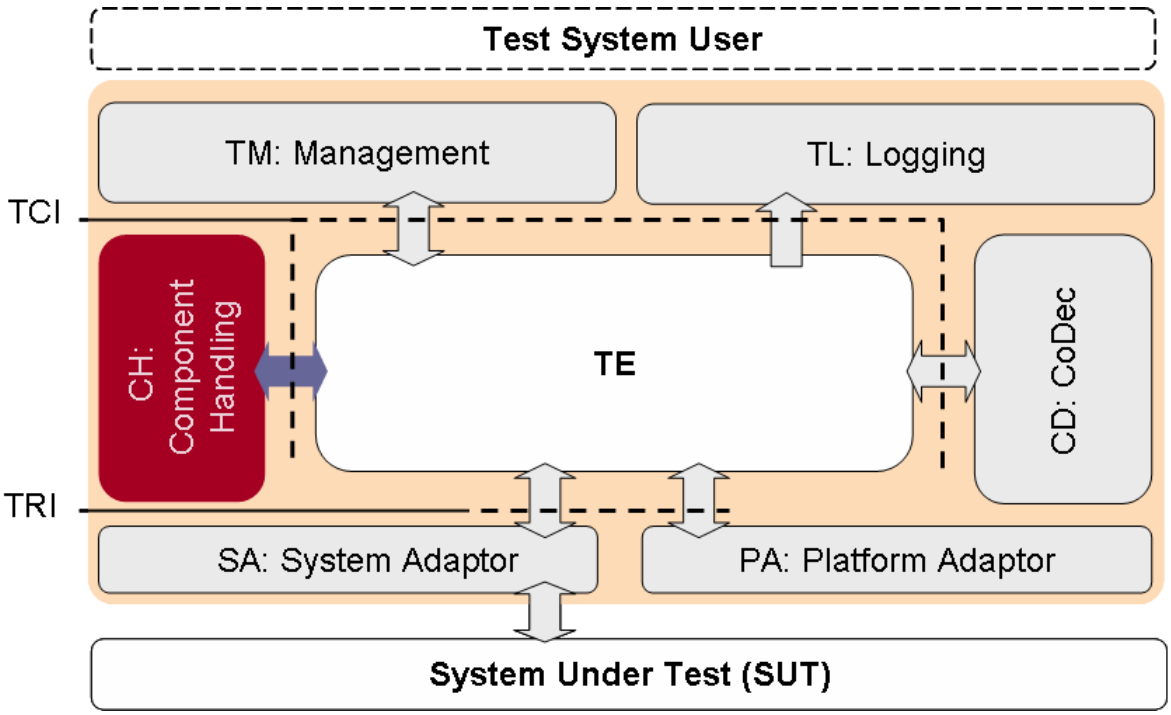

Figure 7: The TCI-CH interface

A component handling implementation distributes TTCN-3 configuration operations like create, connect and start and intercomponent communication like send on a connected port among one or more TTCN-3 Executables participating in a test session. Note that although multiple instances of a TE might participate in a test session this is not mandatory.

The basic principle is that TCI-CH is not *implementing* any kind of TTCN-3 functionality. Instead it will be informed by the TE that for example a test component shall be created. Based on Component Handling (CH) internal knowledge the request for creation of a test component will be transmitted to another (remote) participating TE. This second (remote) participating TE will create the TTCN-3 component and will provide a handle back to the requesting (local) TE. The requesting (local) TE can now operate on the created test component via this component handle.

Within the operation definitions the terms local TE and remote TE is used to highlight the fact that a test system implementation might be distributed over several test devices, each of them hosting a complete TE. The terms "local" and "remote" always refer to the interfaces currently being described. For convenience, the term "local" refers always to the TE being either the callee of an operation (for *required* operations) or the caller of an operation (for *provided* operations). While the TE is conceptually considered as being distributed, the CH is considered to be non-distributed. This can either be achieved using a centralized architecture or by using a middleware-platform that abstracts from distribution aspects. Although the TE might be distributed over different physical devices, there might be configurations where only one, non-distributed TE will participate in a test session. In this case the term "local" and "remote" refer to the same TE instance.

Clause 12 illustrates the usage and sequential ordering of operation calls by either the TE or the CH.

Although all TTCN-3 Executables participating in a test session are equal, there is a distinct TE*. This TE* is the TE where the explicit `tciStartTestCase`() or `tciStartControl` () has been processed. The reason for this distinction is, that TE* shall calculate the global verdict. TE* will notify the test management upon termination of test execution and shall provide then the global verdict of the test case.

7.3.3.1 TCI-CH required

This clause specifies the operations the CH requires from the TE. In addition to the operations specified in this clause, all *required* operations of the TCI-CD interface are also required.

7.3.3.1.1 tciEnqueueMsgConnected

Signature	`void tciEnqueueMsgConnected (in TriPortIdType sender, in TriComponentIdType receiver, in Value rcvdMessage)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receiver`	Identifier of the receiving component.
	`rcvdMessage`	The value to be enqueued.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at remote TE a *provided* `tciSendConnected` has been called.	
Effect	The TE enqueues the received value into the local port queue of the indicated receiver component.	

7.3.3.1.2 tciEnqueueCallConnected

Signature	`void tciEnqueueCallConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in TciParameterListType parameterList)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receiver`	Identifier of the receiving component.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of value parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciCallConnected` has been called. All *in* and *inout* procedure parameters contain values. All *out* procedure parameters shall contain the distinct value of `null` because they are only of relevance in a reply to the procedure call but not in the procedure call itself. The procedure parameters are the parameters specified in the TTCN-3 signature template.	
Effect	The TE enqueues the calls at the local port queue of the indicated receiver component.	

7.3.3.1.3 tciEnqueueReplyConnected

Signature	`void tciEnqueueReplyConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in TciParameterListType parameterList, in Value returnValue)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receiver`	Identifier of the component receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of value parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
	`returnValue`	(Optional) return value of the procedure call.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciReplyConnected` has been called. All *out* and *inout* procedure parameters and the return value contain values. All *in* procedure parameters shall contain the distinct value of `null` since they are only of relevance to the procedure call but not in the reply to the call. The `parameterList` contains procedure call parameters. These parameters are the parameters specified in the TTCN-3 signature template. If no return type has been defined for the procedure signature in the TTCN-3 ATS, the distinct value `null` shall be passed for the `returnValue`.	
Effect	The TE enqueues the reply at the local port queue of the indicated receiver component.	

7.3.3.1.4 tciEnqueueRaiseConnected

Signature	`void tciEnqueueRaiseConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in Value exception)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receiver`	Identifier of the component receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`exception`	The exception.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciRaiseConnected` has been called.	
Effect	The TE enqueues the exception at the local port queue of the indicated receiver component.	

7.3.3.1.5 tciCreateTestComponent

Signature	`TriComponentIdType tciCreateTestComponent (in TciTestComponentKindType kind, in Type componentType), in TString name)`	
In Parameters	`kind`	The kind of component that shall be created (any kind except of `SYSTEM`).
	`componentType`	Identifier of the TTCN-3 component type that shall be created.
	`name`	Name of the component that shall be created.
Return Value	A `TriComponentIdType` value for the created component.	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided tciCreateTestComponentReq* has been called. `componentType` shall be set to the distinct value `null` if a test component of kind `control` shall be created. `name` shall be set to the distinct value `null` if no name is given in the TTCN-3 create statement.	
Effect	The TE creates a TTCN-3 test component of the `componentType` and passes a `TriComponentIdType` reference back to the CH. The CH communicates the reference back to the remote TE.	

7.3.3.1.6 tciStartTestComponent

Signature	`void tciStartTestComponent(in TriComponentIdType component, in TciBehaviourIdType behaviour, in TciParameterListType parameterList)`	
In Parameters	`component`	Identifier of the component to be started. Refers to an identifier previously created by a call of `tciCreateTestComponent`
	`behaviour`	Identifier of the behaviour to be started on the component.
	`parameterList`	A list of Values where each value defines a parameter from the parameter list as defined in the TTCN-3 function declaration of the function being started. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature of the test case. If no parameters have to be passed either the `null` value or an empty `parameterList`, i.e. a list of length zero shall be passed.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciStartTestComponentReq` has been called.	
Effect	The TE shall start the indicated behaviour on the indicated component.	

7.3.3.1.7 tciStopTestComponent

Signature	`void tciStopTestComponent(in TriComponentIdType component)`	
In Parameters	`component`	Identifier of the component to be stopped.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciStopTestComponentReq` has been called.	
Effect	The TE shall stop the indicated behaviour on the indicated component.	

7.3.3.1.8 tciConnect

Signature	`void tciConnect (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be connected from.
	`toPort`	Identifier of the test component port to be connected to.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciConnect` has been called.	
Effect	The TE shall connect the indicated ports to one another.	

7.3.3.1.9 tciDisconnect

Signature	`void tciDisconnect (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be disconnected.
	`toPort`	Identifier of the test component port to be disconnected.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciDisconnect` has been called.	
Effect	The TE shall disconnect the indicated ports.	

7.3.3.1.10 tciMap

Signature	`void tciMap (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be mapped from.
	`toPort`	Identifier of the test component port to be mapped to.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciMapReq` has been called.	
Effect	The TE shall map the indicated ports to one another.	

7.3.3.1.11 tciUnmap

Signature	`void tciUnmap (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be unmapped.
	`toPort`	Identifier of the test component port to be unmapped.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciUnmapReq` has been called.	
Effect	The TE shall unmap the indicated ports.	

7.3.3.1.12 tciTestComponentTerminated

Signature	`void tciTestComponentTerminated (in TriComponentIdType component, in VerdictValue verdict)`	
In Parameters	`component`	Identifier of the component that has terminated.
	`verdict`	Verdict after termination of the component.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciTestComponentTerminatedReq` has been called.	
Effect	The local TE is notified of the termination of the indicated test component on a remote TE. Because the out values of *inout* and *out* parameters of a function being executed on a test component have no effect on that test component (ES 201 873-1 [1]), the `tciTestComponentTerminated` operation does not have a `parameterList` parameter.	

7.3.3.1.13 tciTestComponentRunning

Signature	`TBoolean tciTestComponentRunning (in TriComponentIdType component)`	
In Parameters	`component`	Identifier of the component to be checked for running.
Return Value	`true` if the indicated component is still executing a behaviour, `false` otherwise.	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciTestComponentRunningReq` has been called.	
Effect	The local TE determines whether the indicated component is executing a test behaviour. If the component is executing a behaviour `true` will be returned. In any other case, e.g. test component has finished execution, or test component has not been started, etc. `false` will be returned. After the operation returns, the CH will communicate the value back to the remote TE.	

7.3.3.1.14 tciTestComponentDone

Signature	`TBoolean tciTestComponentDone (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for done.
Return Value	`true` if the indicated component has completed executing its behaviour, `false` otherwise.	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciTestComponentDoneReq` has been called.	
Effect	The local TE determines whether the indicated component has completed executing its test behaviour. If the component has completed its behaviour `true` will be returned. In any other case, e.g. test component has not been started, or test component is still executing, `false` will be returned. After the operation returns, the CH will communicate the value back to the remote TE.	

7.3.3.1.15 tciGetMTC

Signature	`TriComponentIdType tciGetMTC()`
Return Value	A `TriComponentIdType` value of the MTC if the MTC executes on the local TE, the distinct value `null` otherwise.
Constraint	This operation can be called by the CH at the appropriate local TE when at a remote TE a *provided* `tciGetMTCReq` has been called.
Effect	The local TE determines whether the MTC is executing on the local TE. If the MTC executes on the local TE the component id of the MTC is being returned. If the MTC is not executed on the local TE the distinct value `null` will be returned. The operation will have no effect on the execution of the MTC. After the operation returns, the CH will communicate the value back to the remote TE.

7.3.3.1.16 tciExecuteTestCase

Signature	`void tciExecuteTestCase (in TciTestCaseIdType testCaseId, in TriPortIdListType tsiPortList)`	
In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
	`tsiPortList`	Contains all ports that have been declared in the definition of the system component for the test case, i.e. the TSI ports. If a system component has not been explicitly defined for the test case, then the `tsiPortList` contains all communication ports of the MTC. The ports in `tsiPortList` are ordered as they appear in the respective TTCN-3 component type declaration. If no ports have to be passed either the `null` value or an empty `tsiPortList`, i.e. a list of length zero shall be passed.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the appropriate local TE when at a remote TE a *provided* `tciExecuteTestCaseReq` has been called.	
Effect	The local TE determines whether static connections to the SUT and the initialization of communication means for TSI ports should be done.	

7.3.3.1.17 tciReset

Signature	`void tciReset ()`
Return Value	`void`
Constraint	This operation shall be called by the CH at appropriate local TEs when at a remote TE a *provided* `tciResetReq` has been called.
Effect	The TE can decide to take any means to reset the test system locally.

7.3.3.1.18 tciKillTestComponent

Signature	`void tciKillTestComponent(in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be killed.
Return Value	`void`	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciKillTestComponentReq` has been called.	
Effect	The TE stops the behaviour on the indicated component if necessary and transfers it into the killed state.	

7.3.3.1.19 tciTestComponentAlive

Signature	`TBoolean tciTestComponentAlive (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for being alive.
Return Value	`true` if the indicated component is alive, `false` otherwise.	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciTestComponentAliveReq` has been called.	
Effect	The local TE determines whether the indicated component is alive. After the operation returns, the CH will communicate the value back to the remote TE.	

7.3.3.1.20 tciTestComponentKilled

Signature	`TBoolean tciTestComponentKilled (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for being killed.
Return Value	`true` if the indicated component has been killed, `false` otherwise.	
Constraint	This operation shall be called by the CH at the local TE when at a remote TE a *provided* `tciTestComponentKilledReq` has been called.	
Effect	The local TE determines whether the indicated component is in the killed state. If it is, `true` will be returned. In any other case, `false` will be returned. After the operation returns, the CH will communicate the value back to the remote TE.	

7.3.3.2 TCI-CH provided

This clause specifies the operations the CH shall provide to the TE.

7.3.3.2.1 tciSendConnected

Signature	`void tciSendConnected (in TriPortIdType sender,`
	`in TriComponentIdType receiver,`
	`in Value sendMessage)`	

In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receiver`	Identifier of the receiving component.
	`sendMessage`	The message to be send.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 unicast send operation on a component port, which has been connected to another component port.	
Effect	Sends an asynchronous transmission only to the given receiver component. CH transmits the message to the remote TE on which receiver is being executed and enqueues the data in the remote TE.	

7.3.3.2.2 tciSendConnectedBC

Signature	`void tciSendConnectedBC (in TriPortIdType sender, in Value sendMessage)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`sendMessage`	The message to be send.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 broadcast send operation on a component port, which has been connected to other component ports.	
Effect	Sends an asynchronous transmission to all components being connected to this port. CH transmits the message to all remote TEs on which receivers are being executed and enqueues the data in the remote TEs.	

7.3.3.2.3 tciSendConnectedMC

Signature	`void tciSendConnectedMC (in TriPortIdType sender, in TriComponentIdListType receivers, in Value sendMessage)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receivers`	Identifiers of the receiving components.
	`sendMessage`	The message to be send.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 multicast send operation on a component port, which has been connected to other component ports.	
Effect	Sends an asynchronous transmission to all given receiver components. CH transmits the message to all remote TEs on which receivers are being executed and enqueues the data in the remote TEs.	

7.3.3.2.4 tciCallConnected

Signature	`void tciCallConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in TciParameterListType parameterList)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receiver`	Identifier of the receiving component.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of value parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 unicast call operation on a component port, which has been connected to another component port. All *in* and *inout* procedure parameters contain values. All *out* procedure parameters shall contain the distinct value of `null` because they are only of relevance in a reply to the procedure call but not in the procedure call itself. The procedure parameters are the parameters specified in the TTCN-3 signature template.	
Effect	On invocation of this operation the TE can initiate the procedure call corresponding to the signature identifier `signature` at the called component receiver. The `tciCallConnected` operation shall return without waiting for the return of the issued procedure call. Note that an optional timeout value, which can be specified in the TTCN-3 ATS for a call operation, is not included in the `tciCallConnected` operation signature. The TE is responsible to address this issue by starting a timer for the TTCN-3 call operation in the PA with a separate TRI operation call, i.e. `triStartTimer`. CH transmits the call to the remote TE on which `receiver` is being executed and enqueues the call in the remote TE.	

7.3.3.2.5 tciCallConnectedBC

Signature	`void tciCallConnectedBC (in TriPortIdType sender, in TriSignatureIdType signature, in TciParameterListType parameterList)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of value parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 broadcast call operation on a component port, which has been connected to other component ports. All *in* and *inout* procedure parameters contain values. All *out* procedure parameters shall contain the distinct value of `null` because they are only of relevance in a reply to the procedure call but not in the procedure call itself. The procedure parameters are the parameters specified in the TTCN-3 signature template.	
Effect	On invocation of this operation the TE can initiate the procedure call corresponding to the signature identifier `signature` at the called component receiver. The `tciCallConnected` operation shall return without waiting for the return of the issued procedure call. Note that an optional timeout value, which can be specified in the TTCN-3 ATS for a call operation, is not included in the `tciCallConnected` operation signature. The TE is responsible to address this issue by starting a timer for the TTCN-3 call operation in the PA with a separate TRI operation call, i.e. `triStartTimer`. CH transmits the call to all remote TEs on which a `receiver` is being executed and enqueues the call in the remote TEs.	

7.3.3.2.6 tciCallConnectedMC

Signature	`void tciCallConnectedMC (in TriPortIdType sender, in TriComponentIdListType receivers, in TriSignatureIdType signature, in TciParameterListType parameterList)`	
In Parameters	`sender`	Port identifier at the sending component via which the message is sent.
	`receivers`	Identifier of the receiving components.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of value parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 multicast call operation on a component port, which has been connected to other component ports. All *in* and *inout* procedure parameters contain values. All *out* procedure parameters shall contain the distinct value of `null` because they are only of relevance in a reply to the procedure call but not in the procedure call itself. The procedure parameters are the parameters specified in the TTCN-3 signature template.	
Effect	On invocation of this operation the TE can initiate the procedure call corresponding to the signature identifier `signature` at the called component receiver. The `tciCallConnected` operation shall return without waiting for the return of the issued procedure call. Note that an optional timeout value, which can be specified in the TTCN-3 ATS for a call operation, is not included in the `tciCallConnected` operation signature. The TE is responsible to address this issue by starting a timer for the TTCN-3 call operation in the PA with a separate TRI operation call, i.e. `triStartTimer`. CH transmits the call to all remote TEs on which a `receiver` is being executed and enqueues the call in the remote TEs.	

7.3.3.2.7 tciReplyConnected

Signature	`void tciReplyConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in TciParameterListType parameterList, in Value returnValue)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receiver`	Identifier of the component receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of encoded parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
	`returnValue`	(Optional) return value of the procedure call.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 unicast reply operation on a component port which has been connected to another component port. All *out* and *inout* procedure parameters and the return value contain values. All *in* procedure parameters shall contain the distinct value of `null` since they are only of relevance to the procedure call but not in the reply to the call. The `parameterList` contains procedure call parameters. These parameters are the parameters specified in the TTCN-3 signature template. If no return type has been defined for the procedure signature in the TTCN-3 ATS, the distinct value `null` shall be passed for the return value.	
Effect	On invocation of this operation the CH can issue the reply to a procedure call corresponding to the signature identifier `signature` and component identifier `receiver`. CH transmits the reply to the remote TE on which `receiver` is being executed and enqueues the reply in the remote TE.	

7.3.3.2.8 tciReplyConnectedBC

Signature	`void tciReplyConnectedBC (in TriPortIdType sender, in TriSignatureIdType signature, in TciParameterListType parameterList, in Value returnValue)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of encoded parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
	`returnValue`	(Optional) return value of the procedure call.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 broadcast reply operation on a component port which has been connected to other component ports. All *out* and *inout* procedure parameters and the return value contain values. All *in* procedure parameters shall contain the distinct value of `null` since they are only of relevance to the procedure call but not in the reply to the call. The `parameterList` contains procedure call parameters. These parameters are the parameters specified in the TTCN-3 signature template. If no return type has been defined for the procedure signature in the TTCN-3 ATS, the distinct value `null` shall be passed for the return value.	
Effect	On invocation of this operation the CH can issue the reply to a procedure call corresponding to the signature identifier `signature` and all components connected to `sender`. CH transmits the exception to all remote TEs on which receivers are being executed and enqueues the exception in the remote TEs.	

7.3.3.2.9 tciReplyConnectedMC

Signature	`void tciReplyConnectedMC (in TriPortIdType sender, in TriComponentIdListType receivers, in TriSignatureIdType signature, in TciParameterListType parameterList, in Value returnValue)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receivers`	Identifier of the components receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`parameterList`	A list of encoded parameters which are part of the indicated signature. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature declaration.
	`returnValue`	(Optional) return value of the procedure call.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 multicast reply operation on a component port which has been connected to other component ports. All *out* and *inout* procedure parameters and the return value contain values. All *in* procedure parameters shall contain the distinct value of `null` since they are only of relevance to the procedure call but not in the reply to the call. The `parameterList` contains procedure call parameters. These parameters are the parameters specified in the TTCN-3 signature template. If no return type has been defined for the procedure signature in the TTCN-3 ATS, the distinct value `null` shall be passed for the return value.	
Effect	On invocation of this operation the CH can issue the reply to a procedure call corresponding to the signature identifier `signature` and one of the component identifier in `receivers`. CH transmits the reply to the remote TEs on which `receivers` are being executed and enqueues the reply in the remote TEs.	

7.3.3.2.10 tciRaiseConnected

Signature	`void tciRaiseConnected (in TriPortIdType sender, in TriComponentIdType receiver, in TriSignatureIdType signature, in Value exception)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receiver`	Identifier of the component receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`exception`	The exception value.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 unicast raise operation on a component port which has been connected to another component port.	
Effect	On invocation of this operation the CH can raise an exception to a procedure call corresponding to the signature identifier `signature` and component identifier `receiver`. CH transmits the exception to the remote TE on which `receiver` is being executed and enqueues the exception in the remote TE.	

7.3.3.2.11 tciRaiseConnectedBC

Signature	`void tciRaiseConnectedBC (in TriPortIdType sender, in TriSignatureIdType signature, in Value exception)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`signature`	Identifier of the signature of the procedure call.
	`exception`	The exception value.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 broadcast raise operation on a component port which has been connected to other component ports.	
Effect	On invocation of this operation the CH can raise an exception to a procedure call corresponding to the signature identifier `signature` and all components connected to `sender`. CH transmits the exception to all remote TEs on which receivers are being executed and enqueues the exception in the remote TEs.	

7.3.3.2.12 tciRaiseConnectedMC

Signature	`void tciRaiseConnectedMC (in TriPortIdType sender, in TriComponentIdListType receiver, in TriSignatureIdType signature, in Value exception)`	
In Parameters	`sender`	Identifier of the port sending the reply.
	`receivers`	Identifiers of the component receiving the reply.
	`signature`	Identifier of the signature of the procedure call.
	`exception`	The exception value.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 multicast raise operation on a component port which has been connected to another component port.	
Effect	On invocation of this operation the CH can raise an exception to a procedure call corresponding to the signature identifier `signature` and one of the component identifier `receivers`. CH transmits the exception to all remote TEs on which `receivers` are being executed and enqueues the exception in the remote TEs.	

7.3.3.2.13 tciCreateTestComponentReq

Signature	`TriComponentIdType tciCreateTestComponentReq (in TciTestComponentKindType kind, in Type componentType, in TString name)`	
In Parameters	`kind`	The kind of component that shall be created (any kind except of `SYSTEM`).
	`componentType`	Identifier of the TTCN-3 component type that shall be created.
Return Value	A `TriComponentIdType` value for the created component.	
Constraint	This operation shall be called from the TE when a component has to be created, either explicitly when the TTCN-3 create operation is called or implicitly when the master test component (MTC) or a control component has to be created. `name` shall be set to the distinct value `null` if no name is given in the TTCN-3 create statement.	
Effect	CH transmits the component creation request to the remote TE and calls there the `tciCreateTestComponent` operation to obtain a component identifier for this component.	

7.3.3.2.14 tciStartTestComponentReq

Signature	`void tciStartTestComponentReq(in TriComponentIdType component, in TciBehaviourIdType behaviour, in TciParameterListType parameterList)`	
In Parameters	`component`	Identifier of the component to be started.
	`behaviour`	Identifier of the behaviour to be started on the component.
	`parameterList`	A list of `Values` where each value defines a parameter from the parameter list as defined in the TTCN-3 function declaration of the function being started. The parameters in `parameterList` are ordered as they appear in the TTCN-3 signature of the test case. If no parameters have to be passed either the `null` value or an empty `parameterList`, i.e. a list of length zero shall be passed.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes the TTCN-3 start operation.	
Effect	CH transmits the start component request to the remote TE and calls there the `tciStartTestComponent` operation.	

7.3.3.2.15 tciStopTestComponentReq

Signature	`void tciStopTestComponentReq(in TriComponentIdType component)`	
In Parameters	`component`	Identifier of the component to be stopped.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes the TTCN-3 stop operation.	
Effect	CH transmits the stop component request to the remote TE and calls there the `tciStopTestComponent` operation.	

7.3.3.2.16 tciConnectReq

Signature	`void tciConnectReq (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be connected from.
	`toPort`	Identifier of the test component port to be connected to.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 connect operation.	
Effect	CH transmits the connection request to the remote TE where it calls the `tciConnect` operation to establish a logical connection between the two indicated ports. Note that both ports can be on remote TEs. In this case, the operation returns only after calling the `tciConnect` operation on both remote TEs.	

7.3.3.2.17 tciDisconnectReq

Signature	`void tciDisconnectReq (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be disconnected.
	`toPort`	Identifier of the test component port to be disconnected.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 disconnect operation.	
Effect	CH transmits the disconnect request to the remote TE where it calls the `tciDisconnect` operation to tear down the logical connection between the two indicated ports. Note that both ports can be on remote TEs. In this case, the operation returns only after calling the `tciDisconnect` operation on both remote TEs.	

7.3.3.2.18 tciMapReq

Signature	`void tciMapReq (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be mapped from.
	`toPort`	Identifier of the test component port to be mapped to.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 map operation.	
Effect	CH transmits the map request to the remote TE where it calls the `tciMap` operation to establish a logical connection between the two indicated ports.	

7.3.3.2.19 tciUnmapReq

Signature	`void tciUnmapReq (in TriPortIdType fromPort, in TriPortIdType toPort)`	
In Parameters	`fromPort`	Identifier of the test component port to be unmapped.
	`toPort`	Identifier of the test component port to be unmapped.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 unmap operation.	
Effect	CH transmits the unmap request to the remote TE where it calls the `tciUnmap` operation to tear down the logical connection between the two indicated ports.	

7.3.3.2.20 tciTestComponentTerminatedReq

Signature	`void tciTestComponentTerminatedReq (in TriComponentIdType component, in VerdictValue verdict)`	
In Parameters	`component`	Identifier of the component that has terminated.
	`verdict`	Verdict after termination of the component.
Return Value	`void`	
Constraint	This operation shall be called by the TE when a test component terminates execution, either explicitly with the TTNC-3 stop operation or implicitly, if it has reached the last statement.	
Effect	The CH is notified of the termination of the indicated test component. Because the out values of *inout* and *out* parameters of a function being executed on a test component have no effect on that test component (ES 201 873-1 [1]), the `tciTestComponentTerminateReq` operation does not have a `parameterList` parameter. CH communicates the termination of the indicated component to all participating TEs and to the special TE*, which keeps track of the overall verdict.	

7.3.3.2.21 tciTestComponentRunningReq

Signature	`TBoolean tciTestComponentRunningReq (in TriComponentIdType component)`	
In Parameters	`component`	Identifier of the component to be checked for running.
Return Value	`true` if the indicated component is still executing a behaviour, `false` otherwise.	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 running operation.	
Effect	CH transmits the running request to the remote TE having the test component to be checked, where it calls the `tciTestComponentRunning` operation to check the execution status of the indicated test component.	

7.3.3.2.22 tciTestComponentDoneReq

Signature	`TBoolean tciTestComponentDoneReq (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for done.
Return Value	`true` if the indicated component has completed executing its behaviour, `false` otherwise.	
Constraint	This operation shall be called by the TE when it executes a TTCN-3 `done` operation.	
Effect	CH transmits the done request to the remote TE having the test component to be checked, where it calls the `tciTestComponentDone` operation to check the status of the indicated test component.	

7.3.3.2.23 tciGetMTCReq

Signature	`TriComponentIdType tciGetMTCReq()`
Return Value	A `TriComponentIdType` value of the MTC.
Constraint	This operation shall be called by the TE when it executes a TTCN-3 mtc operation.
Effect	The CH determines the component id of the MTC.

7.3.3.2.24 tciExecuteTestCaseReq

Signature	`void tciExecuteTestCaseReq (in TciTestCaseIdType testCaseId, in TriPortIdListType tsiPortList)`	
In Parameters	`testCaseId`	A test case identifier as defined in the TTCN-3 module.
	`tsiPortList`	`tsiPortList` contains all ports that have been declared in the definition of the system component for the test case, i.e. the TSI ports. If a system component has not been explicitly defined for the test case, then the `tsiPortList` contains all communication ports of the MTC. The ports in `tsiPortList` are ordered as they appear in the respective TTCN-3 component type declaration. If no ports have to be passed either the `null` value or an empty `tsiPortList`, i.e. a list of length zero shall be passed.
Return Value	`void`	
Constraint	This operation can be called by the TE immediately before it starts the test case behaviour on the MTC (in course of a TTCN-3 execute operation).	
Effect	CH transmits the execute test case request to the remote TEs having system ports of the indicated test case. Static connections to the SUT and the initialization of communication means for TSI ports can be set up.	

7.3.3.2.25 tciResetReq

Signature	`void tciResetReq ()`
Return Value	`void`
Constraint	This operation can be called by the TE at any time to reset the test system.
Effect	CH transmits the reset request to all involved TEs.

7.3.3.2.26 tciKillTestComponentReq

Signature	`void tciKillTestComponentReq(in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be killed.
Return Value	`void`	
Constraint	This operation shall be called by the TE when it executes the TTCN-3 `kill` operation.	
Effect	CH transmits the kill component request to the remote TE and calls there the `tciKillTestComponent` operation.	

7.3.3.2.27 tciTestComponentAliveReq

Signature	`TBoolean tciTestComponentAliveReq (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for being alive.
Return Value	`true` if the indicated component is alive, `false` otherwise.	
Constraint	This operation shall be called by the TE when it executes the TTCN-3 `alive` operation.	
Effect	CH transmits the request to the remote TE that created the test component in question, where it calls the `tciTestComponentAlive` operation to check the status of the indicated test component.	

7.3.3.2.28 tciTestComponentKilledReq

Signature	`TBoolean tciTestComponentKilledReq (in TriComponentIdType comp)`	
In Parameters	`comp`	Identifier of the component to be checked for being killed.
Return Value	`true` if the indicated component has been killed, `false` otherwise.	
Constraint	This operation shall be called by the TE when it executes the TTCN-3 `killed` operation.	
Effect	CH transmits the request to the remote TE that created the test component in question, where it calls the `tciTestComponentKilled` operation to check the status of the indicated test component.	

7.3.4 The TCI-TL interface

The TCI Test Logging Interface (TCI-TL) describes the operations a TTCN-3 Executable is required to implement and the operations a test logging implementation shall provide to the TE (figure 8).

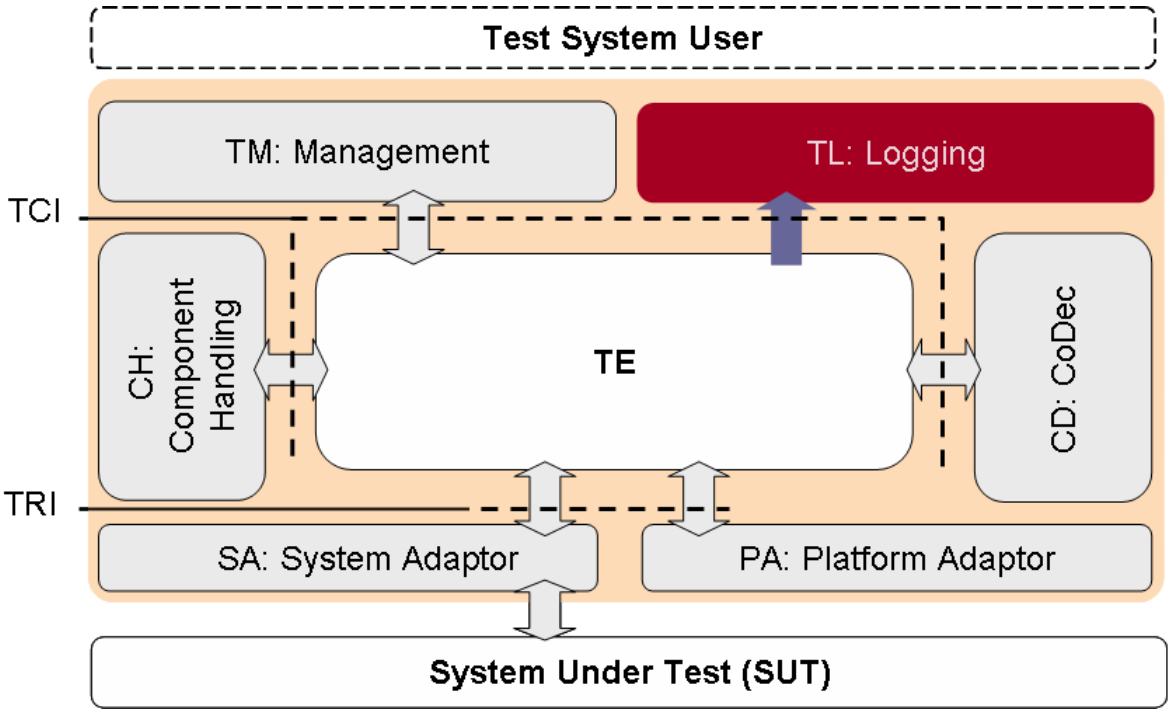

Figure 8: The TCI-TL interface

The logging provides for all TTCN-3 level operations an operation to log the respective event being performed by the TE, the SA, the PA, the CH or the CD to the user.

7.3.4.1 TCI-TL provided

This clause specifies the operations the TL shall provide to the TE.

7.3.4.1.1 tliTcExecute

Signature	`void tliTcExecute(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TciTestCaseIdType tcId, in TciParameterListType triPars, in TriTimerDurationType dur)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`tcId`	The testcase to be executed.
	`triPars`	The list of parameters required by the testcase.
	`dur`	Duration of the execution.
Return Value	`void`	
Constraint	Shall be called by TE to log the execute test case request.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.2 tliTcStart

Signature	`void tliTcStart(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TciTestCaseIdType tcId, in TciParameterListType tciPars, in TriTimerDurationType dur)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`tcId`	The testcase to be executed.
	`tciPars`	The list of parameters required by the testcase.
	`dur`	Duration of the execution.
Return Value	`void`	
Constraint	Shall be called by TE to log the start of a testcase. This event occurs before the testcase is started.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.3 tliTcStop

Signature	`void tliTcStop(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`Am`	An additional message.
	`Ts`	The time when the event is produced.
	`Src`	The source file of the test specification.
	`Line`	The line number where the request is performed.
	`C`	The component which produces this event.
Return Value	`Void`	
Constraint	Shall be called by TE to log the stop of a testcase.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.4 tliTcStarted

Signature	`void tliTcStarted(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TciTestCaseIdType tcId, in TciParameterListType tciPars, in TriTimerDurationType dur)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`tcId`	The testcase to be executed.
	`tciPars`	The list of parameters required by the testcase.
	`dur`	Duration of the execution.
Return Value	`Void`	
Constraint	Shall be called by TM or TE to log the start of a testcase. This event occurs after the testcase was started.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.5 tliTcTerminated

Signature	`void tliTcTerminated(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TciTestCaseIdType tcId, in TciParameterListType tciPars, in VerdictValue verdict)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`tcId`	The testcase to be executed.
	`tciPars`	The list of parameters required by the testcase.
	`verdict`	The verdict of the testcase.
Return Value	`void`	
Constraint	Shall be called by TM or TE to log the termination of a testcase. This event occurs after the testcase terminated.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.6 tliCtrlStart

Signature	`void tliCtrlStart(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log the start of the control part. This event occurs before the control is started. If the control is not represented by a TRI component, c is null.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.7 tliCtrlStop

Signature	`void tliCtrlStop(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log the stop of the control part. This event occurs before the control is stopped. If the control is not represented by a TRI component, c is null.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.8 tliCtrlTerminated

Signature	`void tliCtrlTerminated (in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TM or TE to log the termination of the control part. This event occurs after the control has terminated. If the control is not represented by a TRI component, c is null.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.9 tliMSend_m

Signature	`void tliMSend_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue, in Value addrValue, in TciStatusType encoderFailure, in TriMessageType msg, in TriAddressType address, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`to`	The port to which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`addrValue`	The address value of the destination within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`msg`	The encoded message.
	`address`	The address of the destination within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a unicast send operation. This event occurs after sending. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.10 tliMSend_m_BC

Signature	`void tliMSend_m_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue, in TciStatusType encoderFailure, in TriMessageType msg, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`to`	The port to which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`encoderFailure`	The failure message which might occur at encoding.
	`msg`	The encoded message.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a broadcast send operation. This event occurs after sending. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.11 tliMSend_m_MC

Signature	`void tliMSend_m_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue, in TciValueList addrValues, in TciStatusType encoderFailure, in TriMessageType msg, in TriAddressListType addresses, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`to`	The port to which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`addrValues`	The address values of the destinations within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`msg`	The encoded message.
	`addresses`	The addresses of the destinations within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a multicast send operation. This event occurs after sending. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.12 tliMSend_c

Signature	`void tliMSend_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`to`	The component which will receive the message.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a unicast send operation. This event occurs after sending. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.13 tliMSend_c_BC

Signature	`void tliMSend_c_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in Value msgValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`to`	The ports to which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a broadcast send operation. This event occurs after sending. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.14 tliMSend_c_MC

Signature	`void tliMSend_c_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in Value msgValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is sent.
	`to`	The port to which the message is sent.
	`msgValue`	The value to be encoded and sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a multicast send operation. This event occurs after sending. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.15 tliMDetected_m

Signature	`void tliMDetected_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriMessageType msg, in TriAddressType address)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`from`	The port from which the message has been sent.
	`msg`	The received encoded message.
	`address`	The address of the source within the SUT.
Return Value	`Void`	
Constraint	Shall be called by SA or TE to log the enqueuing of a message. This event occurs after the message is enqueued. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.16 tliMDetected_c

Signature	`void tliMDetected_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in Value msgValue)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`from`	The port from which the message has been sent.
	`msgValue`	The received message.
Return Value	`Void`	
Constraint	Shall be called by CH or TE to log the enqueuing of a message. This event occurs after the message is enqueued. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.17 tliMMismatch_m

Signature	`void tliMMismatch_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in Value msgValue, in TciValueTemplate msgTmpl, in TciValueDifferenceList diffs, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`msgValue`	The message which is checked against the template.
	`msgTmpl`	The template used to check the message match.
	`diffs`	The difference/the mismatch between message and template
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`Void`	
Constraint	Shall be called by TE to log the mismatch of a template. This event occurs after checking a template match. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.18 tliMMismatch_c

Signature	`void tliMMismatch_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in Value msgValue, in TciValueTemplate msgTmpl, in TciValueDifferenceList diffs, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`msgValue`	The message which is checked against the template.
	`msgTmpl`	The template used to check the message match.
	`diffs`	The difference/the mismatch between message and template
	`from`	The component which sent the message.
	`fromTmpl`	The expected sender component.
Return Value	`Void`	
Constraint	Shall be called by TE to log the mismatch of a template. This event occurs after checking a template match. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.19 tliMReceive_m

Signature	`void tliMReceive_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in Value msgValue, in TciValueTemplate msgTmpl, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`msgValue`	The message which is checked against the template.
	`msgTmpl`	The template used to check the message match.
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`Void`	
Constraint	Shall be called by TE to log the receiving of a message. This event occurs after checking a template match. This event is used for logging the communication with SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.20 tliMReceive_c

Signature	`void tliMReceive_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in Value msgValue, in TciValueTemplate msgTmpl, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the message is received.
	`msg`	The message which is checked against the template.
	`msgTmpl`	The template used to check the message match.
	`from`	The component which sent the message.
	`fromTmpl`	The expected sender component.
Return Value	`Void`	
Constraint	Shall be called by TE to log the receive of a message. This event occurs after checking a template match. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.21 tliPrCall_m

Signature	`void tliPrCall_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value addrValue, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriAddressType address, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`addrValue`	The address value of the destination within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`address`	The address of the destination within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by SA or TE to log a unicast call operation. This event occurs after call execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.22 tliPrCall_m_BC

Signature	`void tliPrCall_m_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by SA or TE to log a broadcast call operation. This event occurs after call execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.23 tliPrCall_m_MC

Signature	`void tliPrCall_m_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueList addrValues, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriAddressListType addresses, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`addrValues`	The address values of the destinations within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`addresses`	The addresses of the destinations within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by SA or TE to log a multicast call operation. This event occurs after call execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.24 tliPrCall_c

Signature	`void tliPrCall_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by CH or TE to log a unicast call operation. This event occurs after call execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.25 tliPrCall_c_BC

Signature	`void tliPrCall_c_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port list to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by CH or TE to log a broadcast call operation. This event occurs after call execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.26 tliPrCall_c_MC

Signature	`void tliPrCall_c_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is invoked.
	`to`	The port list to which the call is sent.
	`signature`	The signature of the called operation.
	`tciPars`	The parameters of the called operation.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`Void`	
Constraint	Shall be called by CH or TE to log a multicast call operation. This event occurs after call execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.27 tliPrGetCallDetected_m

Signature	`void tliPrGetCallDetected_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in TriParameterListType triPars, in TriAddressType address)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`from`	The port from which the call has been sent.
	`signature`	The signature of the detected call.
	`triPars`	The encoded parameters of detected call.
	`address`	The address of the destination within the SUT.
Return Value	`Void`	
Constraint	Shall be called by SA or TE to log the getcall enqueue operation. This event occurs after call is enqueued. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.28 tliPrGetCallDetected_c

Signature	`void tliPrGetCallDetected_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in TciParameterListType tciPars)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`from`	The port from which the call has been sent.
	`signature`	The signature of the called operation.
	`tciPars`	The encoded parameters of detected call.
Return Value	`Void`	
Constraint	Shall be called by CH or TE to log the getcall enqueue operation. This event occurs after call is enqueued. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.29 tliPrGetCallMismatch_m

Signature	`void tliPrGetCallMismatch_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in TciValueDifferenceList diffs, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`signature`	The signature of the detected call.
	`tciPars`	The parameters of detected call.
	`parsTmpl`	The template used to check the parameter match.
	`diffs`	The difference/the mismatch between call and template
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`Void`	
Constraint	Shall be called by TE to log the mismatch of a getcall. This event occurs after getcall is checked against a template. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.30 tliPrGetCallMismatch_c

Signature	`void tliPrGetCallMismatch_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in TciValueDifferenceList diffs, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`signature`	The signature of the detected call.
	`tciPars`	The parameters of detected call.
	`parsTmpl`	The template used to check the parameter match.
	`diffs`	The difference/the mismatch between message and template
	`from`	The component which called the operation.
	`fromTmpl`	The expected calling component.
Return Value	`Void`	
Constraint	Shall be called by TE to log the mismatch of a getcall. This event occurs after getcall is checked against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.31 tliPrGetCall_m

Signature	`void tliPrGetCall_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`signature`	The signature of the detected call.
	`tciPars`	The parameters of detected call.
	`parsTmpl`	The template used to check the parameter match.
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by TE to log getting a call. This event occurs after getcall has matched against a template. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.32 tliPrGetCall_c

Signature	`void tliPrGetCall_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the call is received.
	`signature`	The signature of the detected call.
	`tciPars`	The parameters of detected call.
	`parsTmpl`	The template used to check the parameter match.
	`from`	The component which called the operation.
	`fromTmpl`	The expected calling component.
Return Value	`void`	
Constraint	Shall be called by TE to log getting a call. This event occurs after getcall has matched against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.33 tliPrReply_m

Signature	`void tliPrReply_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue, in Value addrValue, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriParameterType repl, in TriAddressType address, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port to which the reply is sent.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`addrValue`	The address value of the destination within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`repl`	The encoded reply.
	`address`	The address of the destination within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a unicast reply operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.34 tliPrReply_m_BC

Signature	`void tliPrReply_m_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriParameterType repl, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port to which the reply is sent.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`repl`	The encoded reply.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a broadcast reply operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.35 tliPrReply_m_MC

Signature	`void tliPrReply_m_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue, in TciValueList addrValues, in TciStatusType encoderFailure, in TriParameterListType triPars, in TriParameterType repl, in TriAddressListType addresses, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port to which the reply is sent.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`addrValues`	The address values of the destinations within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`triPars`	The encoded parameters.
	`repl`	The encoded reply.
	`addresses`	The addresses of the destinations within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a multicast reply operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.36 tliPrReply_c

Signature	`void tliPrReply_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in Value parsValue, in Value replValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port to which the reply is sent.
	`signature`	The signature relating to the reply.
	`parsValue`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a unicast reply operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.37 tliPrReply_c_BC

Signature	`void tliPrReply_c_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in Value parsValue, in Value replValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port list to which the reply is sent.
	`signature`	The signature relating to the reply.
	`parsValue`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a broadcast reply operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.38 tliPrReply_c_MC

Signature	`void tliPrReply_c_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in Value parsValue, in Value replValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is sent.
	`to`	The port list to which the reply is sent.
	`signature`	The signature relating to the reply.
	`parsValue`	The signature parameters relating to the reply.
	`replValue`	The reply to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a multicast reply operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.39 tliPrGetReplyDetected_m

Signature	`void tliPrGetReplyDetected_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in TriParameterListType triPars, in TriParameterType repl, in TriAddressType address)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`from`	The port from which the reply has been sent.
	`signature`	The signature relating to the reply.
	`triPars`	The encoded parameters of detected reply.
	`repl`	The received encoded reply.
	`address`	The address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log the getreply enqueue operation. This event occurs after getreply is enqueued. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.40 tliPrGetReplyDetected_c

Signature	`void tliPrGetReplyDetected_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`from`	The port from which the reply has been sent.
	`signature`	The signature relating to the reply.
	`tciPars`	The encoded parameters of detected reply.
	`replValue`	The received reply.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log the getreply enqueue operation. This event occurs after getreply is enqueued. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.41 tliPrGetReplyMismatch_m

Signature	`void tliPrGetReplyMismatch_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in Value replValue, in TciValueTemplate replyTmpl, in TciValueDifferenceList diffs, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`parsTmpl`	The template used to check the parameter match.
	`replValue`	The received reply.
	`replyTmpl`	The template used to check the reply match.
	`diffs`	The difference/the mismatch between reply and template
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a getreply operation. This event occurs after getreply is checked against a template. This event is used for logging the communication with SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.42 tliPrGetReplyMismatch_c

Signature	`void tliPrGetReplyMismatch_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in Value replValue, in TciValueTemplate replyTmpl, in TciValueDifferenceList diffs, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`parsTmpl`	The template used to check the parameter match.
	`repl`	The received reply.
	`replyTmpl`	The template used to check the reply match.
	`diffs`	The difference/the mismatch between reply and template
	`from`	The component which sent the reply.
	`fromTmpl`	The expected replying component.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a getreply operation. This event occurs after getreply is checked against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.43 tliPrGetReply_m

Signature	`void tliPrGetReply_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in Value replValue, in TciValueTemplate replyTmpl, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`parsTmpl`	The template used to check the parameter match.
	`replValue`	The received reply.
	`replyTmpl`	The template used to check the reply match.
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by TE to log getting a reply. This event occurs after getreply is checked against a template. This event is used for logging the communication with SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.44 tliPrGetReply_c

Signature	`void tliPrGetReply_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in TciParameterListType tciPars, in TciValueTemplate parsTmpl, in Value replValue, in TciValueTemplate replyTmpl, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the reply is received.
	`signature`	The signature relating to the reply.
	`tciPars`	The signature parameters relating to the reply.
	`parsTmpl`	The template used to check the parameter match.
	`replValue`	The received reply.
	`replyTmpl`	The template used to check the reply match.
	`from`	The component which sent the reply.
	`fromTmpl`	The expected replying component.
Return Value	`void`	
Constraint	Shall be called by TE to log getting a reply. This event occurs after getreply is checked against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.45 tliPrRaise_m

Signature	`void tliPrRaise_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in Value addrValue, in TciStatusType encoderFailure, in TriExceptionType exc, in TriAddressType address, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`addrValue`	The address value of the destination within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`exc`	The encoded exception.
	`address`	The address of the destination within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a unicast raise operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.46 tliPrRaise_m_BC

Signature	`void tliPrRaise_m_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in TciStatusType encoderFailure, in TriExceptionType exc, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`encoderFailure`	The failure message which might occur at encoding.
	`exc`	The encoded exception.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a broadcast raise operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.47 tliPrRaise_m_MC

Signature	`void tliPrRaise_m_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in TciValueList addrValues, in TciStatusType encoderFailure, in TriExceptionType exc, in TriAddressListType addresses, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`addrValues`	The address values of the destinations within the SUT.
	`encoderFailure`	The failure message which might occur at encoding.
	`exc`	The encoded exception.
	`addresses`	The addresses of the destinations within the SUT.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log a multicast raise operation. This event occurs after reply execution. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.48 tliPrRaise_c

Signature	`void tliPrRaise_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a unicast raise operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.49 tliPrRaise_c_BC

Signature	`void tliPrRaise_c_BC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port list to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a broadcast raise operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.50 tliPrRaise_c_MC

Signature	`void tliPrRaise_c_MC(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in TriSignatureIdType signature, in TciParameterListType tciPars, in Value excValue, in TriStatusType transmissionFailure)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is sent.
	`to`	The port list to which the exception is sent.
	`signature`	The signature relating to the exception.
	`tciPars`	The signature parameters relating to the exception.
	`excValue`	The exception to be sent.
	`transmissionFailure`	The failure message which might occur at transmission.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log a multicast raise operation. This event occurs after reply execution. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.51 tliPrCatchDetected_m

Signature	`void tliPrCatchDetected_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in TriExceptionType exc, in TriAddressType address)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`from`	The port from which the exception has been sent.
	`signature`	The signature relating to the exception.
	`exc`	The exception caught.
	`address`	The address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log the catch enqueue operation. This event occurs after catch is enqueued. This event is used for logging the communication with the SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.52 tliPrCatchDetected_c

Signature	`void tliPrCatchDetected_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriSignatureIdType signature, in Value excValue)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`from`	The port from which the exception has been sent.
	`signature`	The signature relating to the exception.
	`excValue`	The catched exception.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log the catch enqueue operation. This event occurs after catch is enqueued. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.53 tliPrCatchMismatch_m

Signature	`void tliPrCatchMismatch_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in Value excValue, in TciValueTemplate excTmpl, in TciValueDifferenceList diffs, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
	`excValue`	The received exception.
	`excTmpl`	The template used to check the exception match.
	`diffs`	The difference/the mismatch between exception and template
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a catch operation. This event occurs after catch is checked against a template. This event is used for logging the communication with SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.54 tliPrCatchMismatch_c

Signature	`void tliPrCatchMismatch_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in Value excValue, in TciValueTemplate excTmpl, in TciValueDifferenceList diffs, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
	`excValue`	The received exception.
	`excTmpl`	The template used to check the exception match.
	`diffs`	The difference/the mismatch between exception and template
	`from`	The component which sent the reply.
	`fromTmpl`	The expected replying component.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a catch operation. This event occurs after catch is checked against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.55 tliPrCatch m

Signature	`void tliPrCatch_m(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in Value excValue, in TciValueTemplate excTmpl, in Value addrValue, in TciValueTemplate addressTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
	`excValue`	The received exception.
	`excTmpl`	The template used to check the exception match.
	`addrValue`	The address value of the source within the SUT.
	`addressTmpl`	The expected address of the source within the SUT.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log catching an exception. This event occurs after catch is checked against a template. This event is used for logging the communication with SUT.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.56 tliPrCatch c

Signature	`void tliPrCatch_c(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature, in Value excValue, in TciValueTemplate excTmpl, in TriComponentIdType from, in TciNonValueTemplate fromTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
	`excValue`	The received exception.
	`excTmpl`	The template used to check the exception match.
	`from`	The component which sent the reply.
	`fromTmpl`	The expected replying component.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log catching an exception. This event occurs after catch is checked against a template. This event is used for logging the intercomponent communication.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.57 tliPrCatchTimeoutDetected

Signature	`void tliPrCatchTimeoutDetected(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the detection of a catch timeout. This event occurs after the timeout is enqueued.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.58 tliPrCatchTimeout

Signature	`void tliPrCatchTimeout (in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType at, in TriSignatureIdType signature)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`at`	The port via which the exception is received.
	`signature`	The signature relating to the exception.
Return Value	`void`	
Constraint	Shall be called by TE to log catching a timeout. This event occurs after the catch timeout has been performed.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.59 tliCCreate

Signature	`void tliCCreate(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp, in TString name, in TBoolean alive)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is created.
	`name`	The name of the component which is created.
	`alive`	If the component is an alive component.
Return Value	`void`	
Constraint	Shall be called by TE to log the create component operation. This event occurs after component creation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.60 tliCStart

Signature	`void tliCStart(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp, in TciBehaviourIdType beh, in TciParameterListType tciPars)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is started.
	`beh`	The behaviour being started on the component.
	`tciPars`	The parameters of the started behaviour.
Return Value	`void`	
Constraint	Shall be called by TE to log the start component operation. This event occurs after component start.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.61 tliCRunning

Signature	`void tliCRunning(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp, in ComponentStatusType status)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is checked to be running.
	`status`	The status of this component.
Return Value	`void`	
Constraint	Shall be called by TE to log the running component operation. This event occurs after component running.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.62 tliCAlive

Signature	`void tliCAlive(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp, in ComponentStatusType status)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is checked to be running.
	`status`	The status of this component.
Return Value	`void`	
Constraint	Shall be called by TE to log the alive component operation. This event occurs after component alive.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.63 tliCStop

Signature	`void tliCStop(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is stopped.
Return Value	`void`	
Constraint	Shall be called by TE to log the stop component operation. This event occurs after component stop.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.64 tliCKill

Signature	`void tliCKill(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The component which is killed.
Return Value	`void`	
Constraint	Shall be called by TE to log the kill component operation. This event occurs after component kill.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.65 tliCDoneMismatch

Signature	`void tliCDoneMismatch(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriComponentIdType comp, in TciNonValueTemplate compTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The first component that did not match.
	`compTmpl`	The template used to check the done match.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a done component operation. This event occurs after done is checked against a template.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.66 tliCDone

Signature	`void tliCDone (in TString am, in TInteger ts, in TString src,`
	`.....in TInteger line, in TriComponentIdType c,`
	`.....in TciNonValueTemplate compTmpl)`	

In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`compTmpl`	The template used to check the done match.
Return Value	`void`	
Constraint	Shall be called by TE to log the done component operation. This event occurs after the done operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.67 tliCKilledMismatch

Signature	`void tliCKilledMismatch(in TString am, in TInteger ts, in TString src,`
	`.....in TInteger line, in TriComponentIdType c,`
	`.....in TriComponentIdType comp,`
	`.....in TciNonValueTemplate compTmpl)`	

In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`comp`	The first component that did not match.
	`compTmpl`	The template used to check the killed match.
Return Value	`void`	
Constraint	Shall be called by TE to log the mismatch of a killed component operation. This event occurs after killed is checked against a template.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.68 tliCKilled

Signature	`void tliCKilled (in TString am, in TInteger ts, in TString src,`
	`in TInteger line, in TriComponentIdType c,`
	`in TciNonValueTemplate compTmpl)`	

In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`compTmpl`	The template used to check the killed match.
Return Value	`void`	
Constraint	Shall be called by TE to log the killed component operation. This event occurs after the killed operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.69 tliCTerminated

Signature	`void tliCTerminated(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in VerdictValue verdict)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`verdict`	The verdict of the component.
Return Value	`void`	
Constraint	Shall be called by TE to log the termination of a component. This event occurs after the termination of the component.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.70 tliPConnect

Signature	`void tliPConnect(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port1`	The first port to be connected.
	`port2`	The second port to be connected.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log the connect operation. This event occurs after the connect operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.71 tliPDisconnect

Signature	`void tliPDisconnect(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port1`	The first port to be disconnected.
	`port2`	The second port to be disconnected.
Return Value	`void`	
Constraint	Shall be called by CH or TE to log the disconnect operation. This event occurs after the disconnect operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.72 tliPMap

Signature	`void tliPMap(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port1`	The first port to be mapped.
	`port2`	The second port to be mapped.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log the map operation. This event occurs after the map operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.73 tliPUnmap

Signature	`void tliPUnmap(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port1`	The first port to be unmapped.
	`port2`	The second port to be unmapped.
Return Value	`void`	
Constraint	Shall be called by SA or TE to log the unmap operation. This event occurs after the unmap operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.74 tliPClear

Signature	`void tliPClear(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port`	The port to be cleared.
Return Value	`void`	
Constraint	Shall be called by TE to log the port clear operation. This event occurs after the port clear operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.75 tliPStart

Signature	`void tliPStart(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port`	The port to be started.
Return Value	`void`	
Constraint	Shall be called by TE to log the port start operation. This event occurs after the port start operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.76 tliPStop

Signature	`void tliPStop(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port`	The port to be stopped.
Return Value	`void`	
Constraint	Shall be called by TE to log the port stop operation. This event occurs after the port stop operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.77 tliPHalt

Signature	`void tliPHalt(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriPortIdType port)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`port`	The port to be stopped.
Return Value	`void`	
Constraint	Shall be called by TE to log the port halt operation. This event occurs after the port halt operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.78 tliEncode

Signature	`void tliEncode(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in Value val, in TciStatusType encoderFailure, in TriMessageType msg, in TString codec)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`value`	The value to be encoded.
	`encoderFailure`	The failure message which might occur at encoding.
	`msg`	The encoded value.
	`codec`	The used encoder.
Return Value	`void`	
Constraint	Shall be called by CD or TE to log the encode operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.79 tliDecode

Signature	`void tliDecode(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriMessageType msg, in TciStatusType decoderFailure, in Value val, in TString codec)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`msg`	The value to be decoded.
	`decoderFailure`	The failure message which might occur at decoding.
	`val`	The decoded value.
	`codec`	The used decoder.
Return Value	`void`	
Constraint	Shall be called by CD or TE to log the decode operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.80 tliTTimeoutDetected

Signature	`void tliTTimeoutDetected(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer that timed out.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the detection of a timeout. This event occurs after timeout is enqueued.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.81 tliTTimeoutMismatch

Signature	`void tliTTimeoutMismatch(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TciNonValueTemplate timerTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The first timer that did not match.
	`timerTmpl`	The timer template that did not match.
Return Value	`void`	
Constraint	Shall be called by TE to log a timeout mismatch. This event occurs after a timeout match failed.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.82 tliTTimeout

Signature	`void tliTTimeout(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TciNonValueTemplate timerTmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer that matched.
	`timerTmpl`	The timer template that matched.
Return Value	`void`	
Constraint	Shall be called by TE to log a timeout match. This event occurs after a timeout matched.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.83 tliTStart

Signature	`void tliTStart(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TriTimerDurationType dur)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer that is started.
	`dur`	The timer duration.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the start of a timer. This event occurs after the start timer operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.84 tliTStop

Signature	`void tliTStop(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TriTimerDurationType dur)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer that is stopped.
	`dur`	The duration of the timer when it was stopped.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the stop of a timer. This event occurs after the stop timer operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.85 tliTRead

Signature	`void tliTRead(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TriTimerDurationType elapsed)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer that is started.
	`elapsed`	The elapsed time of the timer.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the reading of a timer. This event occurs after the read timer operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.86 tliTRunning

Signature	`void tliTRunning(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TriTimerIdType timer, in TimerStatusType status)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`timer`	The timer which is checked to be running.
	`status`	The status of this component.
Return Value	`void`	
Constraint	Shall be called by PA or TE to log the running timer operation. This event occurs after the running timer operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.87 tliSEnter

Signature	`void tliSEnter(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars, in TString kind)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`name`	The name of the scope.
	`tciPars`	The parameters of the scope.
	`kind`	The kind of the scope.
Return Value	`void`	
Constraint	Shall be called by TE to log the entering of a scope. This event occurs after the scoped has been entered.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.88 tliSLeave

Signature	`void tliSLeave(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars, in Value returnValue, in TString kind)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`name`	The name of the scope.
	`tciPars`	The parameters of the scope.
	`returnValue`	The return value of the scope.
	`kind`	The kind of the scope.
Return Value	`void`	
Constraint	Shall be called by TE to log the leaving of a scope. This event occurs after the scoped has been leaved.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.89 tliVar

Signature	`void tliVar(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in QualifiedName name, in Value varValue)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`name`	The name of the variable.
	`varValue`	The new value of the variable.
Return Value	`void`	
Constraint	Shall be called by TE to log the modification of the value of a variable. This event occurs after the value has been changed.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.90 tliModulePar

Signature	`void tliModulePar(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in QualifiedName name, in Value parValue)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`name`	The name of the module parameter.
	`parValue`	The value of the module parameter.
Return Value	`void`	
Constraint	Shall be called by TE to log the value of a module parameter. This event occurs after the access to the value of a module parameter.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.91 tliGetVerdict

Signature	`void tliGetVerdict(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in VerdictValue verdict)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`verdict`	The current value of the local verdict.
Return Value	`void`	
Constraint	Shall be called by TE to log the getverdict operation. This event occurs after the getverdict operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.92 tliSetVerdict

Signature	`void tliSetVerdict(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in VerdictValue verdict, in TString reason)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`verdict`	The value to be set to the local verdict.
	`reason`	The optional reason of the setverdict statement
Return Value	`void`	
Constraint	Shall be called by TE to log the setverdict operation or the occurrence of a runtime error. If used to log the setverdict operation, then this event occurs after the setverdict operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.93 tliLog

Signature	`void tliLog (in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TString log)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`log`	The string to be logged.
Return Value	`void`	
Constraint	Shall be called by TM or TE to log the TTCN-3 statement log. This event occurs after the TTCN-3 log operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.94 tliAEnter

Signature	`void tliAEnter(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log entering an alt. This event occurs after an alt has been entered.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.95 tliALeave

Signature	`void tliALeave(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log leaving an alt. This event occurs after the alt has been leaved.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.96 tliANomatch

Signature	`void tliANomatch (in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log the nomatch of an alt. This event occurs after the alt has not matched.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.97 tliARepeat

Signature	`void tliARepeat(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log repeating an alt. This event occurs when the alt is been repeated.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.98 tliADefaults

Signature	`void tliADefaults(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log entering the default section. This event occurs after the default section has been entered.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.99 tliAActivate

Signature	`void tliAActivate(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars, in Value ref)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`name`	The name of the default.
	`tciPars`	The parameter of the default.
	`ref`	The resulting default reference.
Return Value	`void`	
Constraint	Shall be called by TE to log the activation of a default. This event occurs after the default activation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.100 tliADeactivate

Signature	`void tliADeactivate(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in Value ref)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`ref`	The resulting default reference.
Return Value	`void`	
Constraint	Shall be called by TE to log the deactivation of a default. This event occurs after the default deactivation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.101 tliAWait

Signature	`void tliAWait(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentId c)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
Return Value	`void`	
Constraint	Shall be called by TE to log that the component awaits events for a new snapshot.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.102 tliAction

Signature	`void tliAction(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TString action)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`action`	The action to be performed.
Return Value	`void`	
Constraint	Shall be called by TE to log that the component executed an SUT action.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.103 tliMatch

Signature	`void tliMatch(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in Value expr, in TciValueTemplate tmpl)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`expr`	The expression to be matched with tmpl.
	`tmpl`	The template to be matched with expr.
Return Value	`void`	
Constraint	Shall be called by TE to log that the component successfully executed a match operation.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.104 tliMatchMismatch

Signature	`void tliMatchMismatch(in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in Value expr, in TciValueTemplate tmpl, in TciValueDifferenceList diffs)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`expr`	The expression to be matched with tmpl
	`tmpl`	The template to be matched with expr
	`diffs`	The difference/the mismatch between expr and tmpl
Return Value	`void`	
Constraint	Shall be called by TE to log that the component unsuccessfully executed a match operation – a mismatch occurred.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

7.3.4.1.105 tliInfo

Signature	`void tliInfo (in TString am, in TInteger ts, in TString src, in TInteger line, in TriComponentIdType c, in TInteger level, in TString info)`	
In Parameters	`am`	An additional message.
	`ts`	The time when the event is produced.
	`src`	The source file of the test specification.
	`line`	The line number where the request is performed.
	`c`	The component which produces this event.
	`level`	The information level.
	`info`	The information.
Return Value	`void`	
Constraint	Can be called by TE to log additional information during test execution. The generation of this event is tool dependent as well as the usage of the parameters level and info.	
Effect	The TL presents all the information provided in the parameters of this operation to the user, how this is done is not within the scope of the present document.	

8 Java language mapping

8.1 Introduction

This clause introduces the TCI Java language mapping. For efficiency reasons a dedicated language mapping is introduced instead of using the OMG IDL to Java language.

The Java language mapping for the TTCN-3 Control Interface defines how the IDL definitions described in clause 7 are mapped to the Java language. The language mapping is independent of the used Java version as only basic Java language constructs are used.

8.2 Names and scopes

8.2.1 Names

Although there are no conflicts between identifiers used in the IDL definition and the Java language some naming translation rules are applied to the IDL identifiers.

Java interfaces or class identifiers are omitting the trailing `Type` used in the IDL definition.

EXAMPLE: The IDL type **`TciTestCaseIdType`** maps to `TciTestCaseId` in Java.

The resulting mapping conforms to the standard Java coding conventions.

8.2.2 Scopes

The IDL module **`tciInterface`** is mapped to the Java package `org.etsi.ttcn3.tci`. All IDL type declarations within this module are mapped to Java classes or interface declarations within this package.

Type mapping

Basic type mapping

Table 2 gives an overview on how the native types TBoolean, TFloat, TInteger, TString, and TStringSeq are mapped to the Java types.

Table 2: Basic type mappings

IDL Type	Java Type
`TBoolean`	`boolean`
`TFloat`	`float`
`TInteger`	`int`
`TString`	`java.lang.String`
`TStringSeq`	`java.lang.String[]`

boolean

The IDL **`TBoolean`** type is mapped to the java basic type `boolean`.

float

The IDL **`TFloat`** type is mapped to the java basic type `float`.

char

The IDL **`TChar`** type is mapped to the java basic type `char`.

int

The IDL **`TInteger`** type is mapped to the java basic type `int`.

String

The IDL **`TString`** type is mapped to the `java.lang.String` class without range checking or bounds for characters in the string. All possible strings defined in TTCN-3 can be converted to `java.lang.String`.

String[]

The IDL **`TStringSeq`** type is mapped to an array of the `java.lang.String` class.

Universal Char

The IDL **`TUniversalChar`** type is mapped to a java basic type `int`. The integer uses the canonical form as defined in ISO/IEC 10646-1 [5], clause 6.2.

Structured type mapping

The TCI IDL description defines user defined types as native types. In the Java language mapping these types are mapped to Java interfaces. The interfaces define methods and attributes being available for objects implementing this interface.

8.2.2.1 TciParameterType

`TciParameterType` is mapped to the following interface:

```
// TCI IDL TciParameterType
package org.etsi.ttcn.tci;
public interface TciParameter {
    public String   getParameterName();
    public void     setParameterName(String name);
    public int      getParameterPassingMode();
    public void     setParameterPassingMode(TciParameterPassingMode mode);
    public Value    getParameter();
    public void     setParameter(Value parameter);
}
```

Methods:

- `getParameterName ()` Returns the parameter name as defined in the TTCN-3 specification.
- `setParameterName (String name)` Sets the name of this `TciParameter` parameter to `name`.
- `getParameterPassingMode()` Returns the parameter passing mode of this parameter.
- `setParameterPassingMode(TciParameterPassingMode mode)` Sets the parameter mode of this `TriParameter` parameter to `mode`.
- `getParameter()` Returns the Value parameter of this TciParameter, or the `null` object if the parameter contains the distinct value `null`.
- `setParameter(Value parameter)` Sets the Value parameter of this TciParameter to parameter. If the distinct value `null` shall be set to indicate that this parameter holds no value, the Java `null` shall be passed as parameter.

8.2.2.2 TciParameterPassingModeType

`TciParameterPassingModeType` is mapped to the following interface:

```
// TCI IDL TciParameterPassingModeType
package org.etsi.ttcn.tci;
public interface TciParameterPassingMode {
    public final static int TCI_IN      = 0;
    public final static int TCI_INOUT   = 1;
    public final static int TCI_OUT     = 2;
}
```

Constants:

- `TCI_IN` Will be used to indicate that a `TciParameter` is an `in` parameter.
- `TCI_INOUT` Will be used to indicate that a `TciParameter` is an `inout` parameter.
- `TCI_OUT` Will be used to indicate that a `TciParameter` is an `out` parameter.

8.2.2.3 TciParameterListType

`TciParameterListType` is mapped to the following interface:

```
// TCI IDL TciParameterListType
package org.etsi.ttcn.tci;
public interface TciParameterList {
    public int                      size() ;
    public boolean                  isEmpty() ;
    public java.util.Enumeration    getParameters() ;
    public TciParameter             get(int index) ;
    public void                     clear() ;
    public void                     add(TciParameter parameter) ;
    public void                     setParameters(TciParameter[] parameters) ;
}
```

Methods:

- `size()` Returns the number of parameters in this list.
- `isEmpty()` Returns `true` if this list contains no parameters.
- `getParameters()` Returns an `Enumeration` over the parameters in the list. The enumeration provides the parameters in the same order as they appear in the list.
- `get(int index)` Returns the `TciParameter` at the specified position.
- `clear()` Removes all parameters from this `TciParameterList`.
- `add(TciParameter parameter)` Adds `parameter` to the end of this `TciParameterList`.
- `setParameter(TciParameter[] parameters)` Fills this `TciParameterList` with `parameters`.

8.2.2.4 TciTypeClassType

`TciTypeClassType` is mapped to the following interface:

```
// TCI IDL TciTypeClassType
package org.etsi.ttcn.tci;
public interface TciTypeClass {
    public final static int ADDRESS                = 0 ;
    public final static int ANYTYPE                = 1 ;
    public final static int BITSTRING              = 2 ;
    public final static int BOOLEAN                = 3 ;
    public final static int CHARSTRING             = 5 ;
    public final static int COMPONENT              = 6 ;
    public final static int ENUMERATED             = 7 ;
    public final static int FLOAT                  = 8 ;
    public final static int HEXSTRING              = 9 ;
    public final static int INTEGER                = 10 ;
    public final static int OCTETSTRING            = 12 ;
    public final static int RECORD                 = 13 ;
    public final static int RECORD_OF              = 14 ;
    public final static int SET                    = 15 ;
    public final static int SET_OF                 = 16 ;
    public final static int UNION                  = 17 ;
    public final static int UNIVERSAL_CHARSTRING   = 19 ;
    public final static int VERDICT                = 20 ;
    public final static int ARRAY                  = 21 ;
}
```

8.2.2.5 TciTestComponentKindType

`TciTestComponentKindType` is mapped to the following interface:

```
// TCI IDL TciTestComponentKindType
public interface TciTestComponentKind {
    public final static int TCI_CTRL_COMP       = 0;
    public final static int TCI_MTC_COMP        = 1;
    public final static int TCI_PTC_COMP        = 2;
    public final static int TCI_SYSTEM_COMP     = 3;
    public final static int TCI_ALIVE_COMP      = 4;
}
```

8.2.2.6 TciBehaviourIdType

`TciBehaviourIdType` is mapped to the following interface:

```
// TCI IDL TciBehaviourIdType
package org.etsi.ttcn.tci;
public interface TciBehaviourId extends QualifiedName {
}
```

8.2.2.7 TciTestCaseIdType

`TciTestCaseIdType` is mapped to the following interface:

```
// TCI IDL TciTestCaseIdType
package org.etsi.ttcn.tci;
public interface TciTestCaseId  extends QualifiedName {
}
```

8.2.2.8 TciModuleIdType

`TciModuleIdType` is mapped to the following interface:

```
// TCI IDL TciModuleIdType
package org.etsi.ttcn.tci;
public interface TciModuleId  extends QualifiedName {
}
```

8.2.2.9 TciModuleParameterIdType

`TciModuleParameterIdType` is mapped to the following interface:

```
// TCI IDL TciModuleParameterIdType
package org.etsi.ttcn.tci;
public interface TciModuleParameterId  extends QualifiedName {
}
```

8.2.2.10 TciModuleParameterListType

`TciModuleParameterListType` is mapped to the following interface:

```
// TCI IDL TciModuleParameterListType
package org.etsi.ttcn.tci;
public interface TciModuleParameterList {
    public int                      size() ;
    public boolean                  isEmpty() ;
    public java.util.Enumeration    getModuleParameters() ;
    public TciModuleParameter       get(int index) ;
}
```

Methods:

- `size()` Returns the number of module parameters in this list.
- `isEmpty()` Returns `true` if this list contains no module parameters.
- `getModuleParameters()` Returns an `Enumeration` over the module parameters in the list. The enumeration provides the module parameters in the same order as they appear in the list.
- `get(int index)` Returns the `TciModuleParameter` at the specified position.

8.2.2.11 TciModuleParameterType

`TciModuleParameterType` is mapped to the following interface:

```
// TCI IDL TciModuleParameterType
package org.etsi.ttcn.tci;
public interface TciModuleParameter {
    public String       getModuleParameterName();
    public Value        getDefaultValue();
}
```

Methods:

- `getModuleParameterName ()` Returns the module parameter name as defined in the TTCN-3 specification.
- `getDefaultValue()` Returns the default Value module parameter of this `TciModuleParameter`, or the `null` object if the module parameter contains the distinct value `null`.

8.2.2.12 TciParameterTypeListType

`TciParameterTypeListType` is mapped to the following interface:

```
// TCI IDL TciParameterTypeListType
package org.etsi.ttcn.tci;
public interface TciParameterTypeList {
    public int                      size() ;
    public boolean                  isEmpty() ;
    public java.util.Enumeration    getParameterTypes() ;
    public TciParameterType         get(int index) ;
}
```

Methods:

- `size()` Returns the number of parameter types in this list.
- `isEmpty()` Returns `true` if this list contains no parameter types.
- `getParameterTypes()` Returns an `Enumeration` over the parameter types in the list. The enumeration provides the parameter types in the same order as they appear in the list.
- `get(int index)` Returns the `TciParameterType` at the specified position.

8.2.2.13 TciParameterTypeType

`TciParameterTypeType` is mapped to the following interface:

```
// TCI IDL TciParameterTypeType
package org.etsi.ttcn.tci;
public interface TciParameterType {
    public Type     getParameterType() ;
    public int      getParameterPassingMode();
}
```

Methods:

- `getParameterType()` Returns the `Type` of the parameter.
- `getParameterPassingMode()` Returns the parameter passing mode of this parameter.

8.2.2.14 TciModuleIdListType

`TciModuleIdListType` is mapped to the following interface:

```
// TCI IDL TciModuleIdListType
package org.etsi.ttcn.tci;
public interface TciModuleIdList {
    public int                      size() ;
    public boolean                  isEmpty() ;
    public java.util.Enumeration    tciGetImportedModules() ;
    public TciModuleId              get(int index) ;
}
```

Methods:

- `size()` Returns the number of modules in this list.
- `isEmpty()` Returns `true` if this list contains no modules.

- `tciGetImportedModules()` Returns an `Enumeration` over the modules in the list. The enumeration provides the modules in the same order as they appear in the list.
- `get(int index)` Returns the `TciModuleId` at the specified position.

8.2.3 Abstract type mapping

The TTCN-3 data types are modelled in Java using the abstract type mapping as defined in this clause. The `Type` interface defines only operations used to retrieve in TTCN-3 defined types. No TTCN-3 types can be constructed using the `Type` interface. Types are modelled using the single interface `Type`, that provides methods to identify types and to retrieve values of a given type.

8.2.3.1 Type

`Type` is mapped to the following interface:

```
// TCI IDL Type
package org.etsi.ttcn.tci;
public interface Type {
    public TciModuleId  getDefiningModule ();
    public String       getName ();
    public int          getTypeClass ();
    public Value        newInstance ();
    public String       getTypeEncoding ();
    public String       getTypeEncodingVariant();
    public String[]     getTypeExtension();
}
```

Methods:

- `getDefiningModule()` Returns the module identifier of the module the type has been defined in. If the type represents a TTCN-3 base type the distinct value `null` will be returned.
- `getName()` Returns name of the type as defined in the TTCN-3 module.
- `getTypeClass()` Returns the type class of the respective type. A value of `TciTypeClassType` can have on of the following constants: `ADDRESS, ANYTYPE, BITSTRING, BOOLEAN, CHARSTRING, COMPONENT, ENUMERATED, FLOAT, HEXSTRING, INTEGER, OCTETSTRING, RECORD, RECORD_OF, ARRAY, SET, SET_OF, UNION, UNIVERSAL_CHARSTRING, VERDICT`.
- `newInstance()` Returns a freshly created value of the given type. This initial value of the created value is undefined.
- `getTypeEncoding()` Returns the type encoding attribute as defined in the TTCN-3 module.
- `getTypeEncodingVariant()` This operation returns the value encoding variant attribute as defined in TTCN-3, if any. If no encoding variant attribute has been defined the distinct value `null` will be returned.
- `getTypeEncoding()` Returns the type extension attribute as defined in the TTCN-3 module.

8.2.4 Abstract value mapping

TTCN-3 values can be retrieved from the TE and constructed using the Value interface. The value mapping interface is constructed hierarchically with Value as the basic interface. Specialized interfaces for different types of values have been defined.

8.2.4.1 Value

`Value` is mapped to the following interface:

```
// TCI IDL Value
package org.etsi.ttcn.tci;
public interface Value {
    public Type     getType() ;
    public boolean  notPresent() ;
    public String   getValueEncoding() ;
    public String   getValueEncodingVariant();
}
```

Methods:

- `getType()` Returns the type of the specified value.
- `notPresent()` Returns `true` if the specified value is `omit`, `false` otherwise.
- `getValueEncoding()` This operation returns the value encoding attribute as defined in TTCN-3, if any. If no encoding attribute has been defined the distinct value `null` will be returned.
- `getValueEncodingVariant()` This operation returns the value encoding variant attribute as defined in TTCN-3, if any. If no encoding variant attribute has been defined the distinct value `null` will be returned.

8.2.4.2 IntegerValue

`IntegerValue` type is mapped to the following interface:

```
// IntegerValue
package org.etsi.ttcn.tci;
public interface IntegerValue {
    public void     setInteger(int value);
    public int      getInteger();
}
```

Methods:

- `setInteger(int value)` Sets this IntegerValue to the int value `value`.
- `getInteger()` Returns the int value represented by this IntegerValue.

8.2.4.3 FloatValue

`FloatValue` type is mapped to the following interface:

```
// FloatValue
package org.etsi.ttcn.tci;
public interface FloatValue {
    public void     setFloat(float value);
    public float    getFloat();
}
```

Methods:

- `setFloat(float value)` Sets this FloatValue to the float value `value`.
- `getFloat()` Returns the float value represented by this FloatValue.

8.2.4.4 BooleanValue

`BooleanValue` type is mapped to the following interface:

```
// BooleanValue
package org.etsi.ttcn.tci;
public interface BooleanValue {
    public void     setBoolean(boolean value);
    public boolean  getBoolean();
}
```

Methods:

- `setBoolean(boolean value)` Sets this BooleanValue to the boolean value `value`.
- `getBoolean()` Returns the boolean value represented by this BooleanValue.

8.2.4.5 CharstringValue

`CharstringValue` is mapped to the following interface:

```
// TCI IDL CharstringValue
package org.etsi.ttcn.tci;
public interface CharstringValue {
    String  getString ();
    void    setString (String value);
    char    getChar (int position);
    void    setChar (int position, char value);
    int     getLength ();
    void    setLength (int len);
}
```

Methods:

- `getString()` Returns the string of the TTCN-3 `charstring`. The textual representation of the empty TTCN-3 `charstring` is `''`, while its length is zero.
- `setString(String value)` Sets this `CharstringValue` to `value`.
- `getChar(int position)` Returns the char value of the TTCN-3 charstring at `position`. position 0 denotes the first char of the TTCN-3 `charstring`. Valid values for position are `0` to `length - 1`.
- `setChar(int position, char value)` Set the char at `position` to `value`. Valid values for `position` are `0` to `length - 1`.
- `getLength()` Returns the length of this `CharstringValue` in chars, zero if the value of this `CharstringValue` is `omit`.
- `setLength(int len)` Sets the length of this `CharstringValue` in chars to `len`.

8.2.4.6 BitstringValue

`BitstringValue` is mapped to the following interface:

```
// TCI IDL BitstringValue
package org.etsi.ttcn.tci;
public interface BitstringValue {
    String getString ();
    void   setString (String value);
    int    getBit (int position);
    void   setBit (int position, int value);
    int    getLength ();
    void   setLength (int len);
}
```

Methods:

- `getString()` — Returns the textual representation of this `BitstringValue`, as defined in TTCN-3. E.g. the textual representation of `0101` is `"0101"B`. The textual representation of the empty TTCN-3 `bitstring` is `""B`, while its length is zero.
- `setString(String value)` — Sets the value of this `BitstringValue` according to the textual representation as defined by `value`. E.g. The value of this `BitstringValue` will be `0101` if the textual representation in value is `"0101"B`.
- `getBit(int position)` — Returns the value `(0 | 1)` at position of this TTCN-3 bitstring. position 0 denotes the first bit of the TTCN-3 bitstring. Valid values for position are `0 to length - 1`.
- `setBit(int position, int value)` — Set the bit at position to value `(0 | 1)`. position 0 denotes the first bit in this BitstringValue. Valid values for position are `0 to length - 1`.
- `getLength()` — Returns the length of this `BitstringValue` in bits, zero if the value of this `BitstringValue` is `omit`.
- `setLength(int len)` — Sets the length of this `BitstringValue` in bits to `len`.

8.2.4.7 OctetstringValue

`OctetstringValue` is mapped to the following interface:

```
// TCI IDL OctetstringValue
package org.etsi.ttcn.tci;
public interface OctetstringValue {
    String  getString ();
    void    setString (String value);
    int     getOctet (int position);
    void    setOctet (int position, int value);
    int     getLength ();
    void    setLength (int len);
}
```

Methods:

- `getString()` — Returns the textual representation of this `OctetstringValue`, as defined in TTCN-3. E.g. the textual representation of `0xCAFFEE` is `"CAFFEE"O`. The textual representation of the empty TTCN-3 `octetstring` is `""O`, while its length is zero.
- `setString(String value)` — Sets the value of this `OctetstringValue` according to the textual representation as defined by `value`. E.g. the value of this `OctetstringValue` will be `0xCAFFEE` if the textual representation in value is `"CAFFEE"O`.
- `getOctet(int position)` — Returns the value (0..255) at `position` of this TTCN-3 octetstring. position 0 denotes the first octet of the TTCN-3 octetstring. Valid values for position are `0 to length - 1`.
- `setOctet(int position, int value)` — Set the octet at `position` to value (0..255). position 0 denotes the first octet in the octetstring. Valid values for position are `0 to length - 1`.
- `getLength()` — Returns the length of this `OctetstringValue` in octets, zero if the value of this `OctetstringValue` is `omit`.

- `setLength(int len)` Sets the length of this `OctetstringValue` in octets to `len`.

8.2.4.8 UniversalCharstringValue

`UniversalCharstringValue` is mapped to the following interface:

```
// TCI IDL UniversalCharstringValue
package org.etsi.ttcn.tci;
public interface UniversalCharstringValue {
    String getString ();
    void   setString (String value);
    int    getChar (int position);
    void   setChar (int  position, int value);
    int    getLength ();
    void   setLength (int len);
}
```

Methods:

- `getString()` Returns the textual representation of this `UniversalCharstringValue`, as defined in TTCN-3.
- `setString(String value)` Sets the value of this `UniversalCharstringValue` according to the textual representation as defined by `value`.
- `getChar(int position)` Returns the `UniversalChar` value of the TTCN-3 `universal charstring` at position. position 0 denotes the first `UniversalChar` of the TTCN-3 `universal charstring`. Valid values for `position` are `0 to length - 1`.
- `setChar(int position, char value)` Set the `UniversalChar` at `position` to `value`. Valid values for `position` are `0 to length - 1`.
- `getLength()` Returns the length of this `UniversalCharstringValue` in `UniversalChars`, zero if the value of this `UniversalCharstringValue` is `omit`.
- `setLength(int len)` Sets the length of this `UniversalCharstringValue` in `UniversalChars` to `len`.

8.2.4.9 HexstringValue

`HexstringValue` is mapped to the following interface:

```
// TCI IDL HexstringValue
package org.etsi.ttcn.tci;
public interface HexstringValue {
    String  getString ();
    void    setString (String value);
    int     getHex (int position);
    void    setHex (int position, int value);
    int     getLength ();
    void    setLength (int len);
}
```

Methods:

- `getString()` — Returns the textual representation of this `HextstringValue`, as defined in TTCN-3. E.g. the textual representation of `0xAFFEE` is `"AFFEE"H`. The textual representation of the empty TTCN-3 `hexstring` is `""H`, while its length is zero.
- `setString(String value)` — Sets the value of this `HexstringValue` according to the textual representation as defined by `value`. E.g. the value of this `HexstringValue` will be `0xAFFEE` if the textual representation in `value` is `"AFFEE"H`.
- `getHex(int position)` — Returns the value `(0...15)` at `position` of this TTCN-3 hexstring. position 0 denotes the first hex digits of the TTCN-3 hexstring. Valid values for position are `0 to length - 1`.
- `setHex(int position, int value)` — Set the hex digit at position to value `(0...16)`. position 0 denotes the first octet in the `hexstring`. Valid values for position are `0 to length - 1`.
- `getLength()` — Returns the length of this `HexstringValue` in octets, zero if the value of this `HexstringValue` is `omit`.
- `setLength(int len)` — Sets the length of this `HexstringValue` in hex digits to len.

8.2.4.10 RecordValue

`RecordValue` is mapped to the following interface:

```
// TCI IDL RecordValue
package org.etsi.ttcn.tci;
public interface RecordValue {
    public Value    getField(String fieldName) ;
    public void     setField(String fieldName, Value value) ;
    public String[] getFieldNames() ;
    public void     setFieldOmitted(String fieldName)
}
```

Methods:

- `getField(String fieldName)` — Returns the value of the field named `fieldName`. The return value is the common abstract base type `Value`, as a record field can have any type defined in TTCN-3.
  If the field cannot be obtained from the record the distinct value `null` will be returned.
- `setField(String fieldName, Value value)` — Set the field named `fieldName` of the record to `value`. No assumption shall be made on how a field is stored in a record. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value will be copied. Therefore it should be assumed that subsequent modifications of `value` will not be considered in the record.
- `getFieldNames()` — Returns an array of String of field names, the empty sequence, if the record has no fields.
- `setFieldOmitted(String fieldName)` — Set the field named `fieldName` of the record to `omit`.

8.2.4.11 RecordOfValue

`RecordOfValue` is mapped to the following interface:

```
// TCI IDL RecordOfValue
package org.etsi.ttcn.tci;
public interface RecordOfValue {
    public Value    getField(String fieldName) ;
    public void     setField(int position, Value value) ;
    public void     appendField(Value value) ;
    public Type     getElementType() ;
    public int      getLength() ;
    public void     setLength(int len) ;
    public int      getOffset() ;
}
```

Methods:

- `getField(String fieldName)` — Returns the value of the `record of` at `position` if `position` is between `zero` and `length -1`, the distinct value `null` otherwise. The return value is the common abstract base type `Value`, as `a record of` can have fields of any type defined in TTCN-3.

- `setField(int position, Value value)` — Sets the field at `position` to `value`. If `position` is greater than `(length -1)` the record of will be extended to have the length `(position + 1)`. The `record of` elements between the original position at `length` and `position - 1` will be set to `OMIT`. No assumption shall be made on how a field is stored in a `record of`. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value will be copied. Therefore it should be assumed that subsequent modifications of `value` will not be considered in the `record of`.

- `appendField(Value value)` — Appends the value at the end of the `record of`, i.e. at position `length`. No assumption shall be made on how a field is stored in a `record of`. An internal implementation might choose to store a reference to this value or to copy the value. It is safe to assume that the value will be copied. Therefore it should be assumed that subsequent modifications of `value` will not be considered in the `record of`.

- `getElementType()` — This operation will return the `Type` of the elements of this `record of`.

- `getLength()` — Returns the actual length of the `record of` value, zero if the `record of` value is `OMIT`.

- `setLength(int len)` — Set the length of the `record of` to `len`. If `len` is greater than the original length, newly created elements have the value `OMIT`. If `len` is less or equal than the original length this operation will be ignored.

- `getOffset()` — Returns the lowest possible index. For a `record of` or `set of` value this is always `0`. For an `array` value, this is the lower index bound used in the type definition.

8.2.4.12 UnionValue

`UnionValue` is mapped to the following interface:

```
// TCI IDL UnionValue
package org.etsi.ttcn.tci;
public interface UnionValue {
    Value       getVariant  (String variantName);
    void        setVariant  (String variantName, Value value);
    String      getPresentVariantName ();
    String[]    getVariantNames ();
}
```

Methods:

- `getVariant(String variantName)` Returns the value of the TTCN-3 union `variantName`, if `variantName` equals the result of `getPresentVariantName`, the distinct value `null` otherwise. `variantName` denotes the name of the union variant as defined in TTCN-3.

- `setVariant(String variantName, Value value)` Sets `variantName` of the union to value. If `variantName` is not defined for this union this operation will be ignored. If another variant was selected the new variant will be selected instead.

- `getPresentVariantName()` Returns the variant name that has a value in this union set as a `String`. The distinct value `null` will be returned if no variant is selected.

- `getVariantNames()` Returns an array of `String` of variant names, the empty sequence, if the union has no fields. If the `UnionValue` represents the TTCN-3 `anytype`, i.e. the type class of the type obtained by getType() is ANYTYPE, all predefined and user-defined TTCN-3 types will be returned.

8.2.4.13 EnumeratedValue

`EnumeratedValue` is mapped to the following interface:

```
// TCI IDL EnumeratedValue
package org.etsi.ttcn.tci;
public interface EnumeratedValue {
    String  getEnum ();
    void    setEnum (String enumValue);
}
```

Methods:

- `getEnum()` Returns the string identifier of this `EnumeratedValue`. This identifier equals the identifier in the TTCN-3 specification.

- `setEnum(String enumValue)` Set the enum to `enumValue`. If `enumValue` is not an allowed value for this enumeration the operation will be ignored.

8.2.4.14 VerdictValue

`VerdictValue` is mapped to the following interface:

```
// TCI IDL VerdictValue
package org.etsi.ttcn.tci;
public interface VerdictValue {
    public static final int NONE    = 0;
    public static final int PASS    = 1;
    public static final int INCONC  = 2;
    public static final int FAIL    = 3;
    public static final int ERROR   = 4;
```

```
    public int      getVerdict() ;
    public void     setVerdict(int verdict) ;
}
```

Methods:

- `getVerdict ()` Returns the integer value for this `VerdictValue`. The `integer` is one of the following constants: `ERROR, FAIL, INCONC, NONE, PASS`.
- `setVerdict(int verdict)` Sets this `VerdictValue` to `verdict`. Note that a `VerdictValue` can be set to any of the above mentioned verdicts at any time. The `VerdictValue` does not perform any verdict calculations as defined in TTCN-3. For example, it is legal to set the `VerdictValue` first to `ERROR` and then to `PASS`.

8.2.4.15 AddressValue

`AddressValue` is mapped to the following interface:

```
 // TCI IDL Verdict___Address_Value
> package org.etsi.ttcn.tci;
> public interface AddressValue {
> public int getAddress() ;
> public void setAddress(Value value) ;
> }
>
```

Methods:

- `getAddress()` Returns the value represented by this `AddressValue`.
- `setAddress(Value value)` Sets this `AddressValue` to the value `value`.

8.2.5 Abstract logging types mapping

Additional types are defined to ease the logging of matches between values and templates.

8.2.5.1 TciValueTemplate

`TciValueTemplate` is mapped to the following interface:

```
// TCI IDL TciValueTemplate
package org.etsi.ttcn.tci;
public interface TciValueTemplate {
    public boolean isOmit();
    public boolean isAny();
    public boolean isAnyOrOmit();
    public String getTemplateDef();
}
```

Methods:

- `isOmit()` Returns `true` if the template is `omit`, `false` otherwise.
- `isAny()` Returns `true` if the template is `any`, `false` otherwise.
- `isAnyOrOmit()` Returns `true` if the template is `anyoromit`, `false` otherwise.
- `getTemplateDef()` This operation returns the template definition.

8.2.5.2 TciNonValueTemplate

`TciNonValueTemplate` is mapped to the following interface:

```
// TCI IDL TciNonValueTemplate
package org.etsi.ttcn.tci;
public interface TciNonValueTemplate {
    public boolean isAny();
    public boolean isAll();
    public String getTemplateDef();
}
```

Methods:

- `isAny()` Returns `true` if the template is `any`, `false` otherwise.
- `isAll()` Returns `true` if the template is `all`, `false` otherwise.
- `getTemplateDef()` This operation returns the template definition.

8.2.5.3 TciValueList

`TciValueList` is mapped to the following interface:

```
// TCI IDL TciValueList
package org.etsi.ttcn.tci;
public interface TciValueList{
    public int                      size() ;
    public boolean                  isEmpty() ;
    public Value                    get(int index) ;
}
```

Methods:

- `size()` Returns the number of values in this list.
- `isEmpty()` Returns `true` if this list contains no values.
- `get(int index)` Returns the `Value` at the specified position.

8.2.5.4 TciValueDifference

`TciValueDifference` is mapped to the following interface:

```
// TCI IDL TciValueDifference
package org.etsi.ttcn.tci;
public interface TciValueDifference {
    public Value    getValue();
    public TciValueTemplate getTciValueTemplate();
    public String   getDescription()
}
```

Methods:

- `getValue()` Returns the value of this `TciValueDifference`.
- `getTciValueTemplate ()` Returns the template of this `TciValueDifference`.
- `getDescription()` Returns the description of the mismatch.

8.2.5.5 TciValueDifferenceList

`TciValueDifferenceList` is mapped to the following interface:

```
// TCI IDL TciValueDifferenceList
package org.etsi.ttcn.tci;
public interface TciValueDifferenceList{
    public int                      size() ;
    public boolean                  isEmpty() ;
    public TciValueDifference       get(int index) ;
}
```

Methods:

- `size()` Returns the number of differences in this list.
- `isEmpty()` Returns `true` if this list contains no differences.
- `get(int index)` Returns the `TciValueDifference` at the specified position.

8.3 Constants

Within this Java language mapping constants have been specified. All constants are defined `public final static` and are accessible from every object from every package. The constants defined within this clause are not defined with the IDL clause. Instead they result from the specification of the TCI IDL types marked as native.

The following constants can be used to determine the parameter passing mode of TTCN-3 parameters (see also clause 8.2.2.3).

- `org.etsi.ttcn.tci.TciParameterPassingMode.TCI_IN;`
- `org.etsi.ttcn.tci.TciParameterPassingMode.TCI_INOUT;`
- `org.etsi.ttcn.tri.TciParameterPassingMode.TCI_OUT.`

For the distinct parameter value `null`, the encoded parameter value shall be set to Java `null`.

The following constants shall be used for value handling (see also clause 8.2.2.4).

- `org.etsi.ttcn.tci.TciTypeClass.ADDRESS;`
- `org.etsi.ttcn.tci.TciTypeClass.ANYTYPE;`
- `org.etsi.ttcn.tci.TciTypeClass.BITSTRING;`
- `org.etsi.ttcn.tci.TciTypeClass.BOOLEAN;`
- `org.etsi.ttcn.tci.TciTypeClass.CHARSTRING;`
- `org.etsi.ttcn.tci.TciTypeClass.COMPONENT;`
- `org.etsi.ttcn.tci.TciTypeClass.ENUMERATED;`
- `org.etsi.ttcn.tci.TciTypeClass.FLOAT;`
- `org.etsi.ttcn.tci.TciTypeClass.HEXSTRING;`
- `org.etsi.ttcn.tci.TciTypeClass.INTEGER;`
- `org.etsi.ttcn.tci.TciTypeClass.OCTETSTRING;`
- `org.etsi.ttcn.tci.TciTypeClass.RECORD;`
- `org.etsi.ttcn.tci.TciTypeClass.RECORD_OF;`
- `org.etsi.ttcn.tci.TciTypeClass.SET;`
- `org.etsi.ttcn.tci.TciTypeClass.SET_OF;`

- `org.etsi.ttcn.tci.TciTypeClass.ARRAY;`
- `org.etsi.ttcn.tci.TciTypeClass.UNION;`
- `org.etsi.ttcn.tci.TciTypeClass.UNIVERSAL_CHARSTRING;`
- `org.etsi.ttcn.tci.TciTypeClass.VERDICT.`

The following constants shall be used for component handling (see also clause 8.2.2.5).

- `org.etsi.ttcn.tci.TciTestComponentKind.TCI_CTRL_COMP;`
- `org.etsi.ttcn.tci.TciTestComponentKind.TCI_MTC_COMP;`
- `org.etsi.ttcn.tci.TciTestComponentKind.TCI_PTC_COMP;`
- `org.etsi.ttcn.tci.TciTestComponentKind.TCI_SYSTEM_COMP;`
- `org.etsi.ttcn.tci.TciTestComponentKind.TCI_ALIVE_COMP.`

8.4 Mapping of interfaces

The TCI IDL definition defines four interfaces, the **`TCI-TM`,** the **`TCI-CH`**, the **`TCI-CD`**, and the **`TCI-TL`** interface. The operations are defined for different directions within this interface, i.e. some operations can only be called by the TTCN-3 Executable (TE), the System Adaptor (SA) or the Platform Adaptor (PA) on the Test Management and Control (TMC) while others can only be called by the TMC on the TE. This is reflected by dividing the TCI IDL interfaces in two sub interfaces, each suffixed by `Required` or `Provided`.

Table 3: Sub interfaces

Calling/Called	TE	TM	CD	CH	SA	PA	TL
TE	-	TCI-TM Provided	TCI-CD Provided	TCI-CH Provided	See ES 201 873-5 [3]	See ES 201 873-5 [3]	TCI-TL Provided
TM	TCI-TM Required	-	-	-	-	-	TCI-TL Provided
CD	TCI-CD Required	-	-	-	-	-	TCI-TL Provided
CH	TCI-CH Required	-	-	-	-	-	TCI-TL Provided
SA	See ES 201 873-5 [3]	-	-	-	-	-	TCI-TL Provided
PA	See ES 201 873-5 [3]	-	-	-	-	-	TCI-TL Provided
TL	-	-	-	-	-	-	-

All methods defined in these interfaces should behave as defined in clause 7.

8.4.1 The TCI-TM interface

8.4.1.1 TCI-TM provided

The `TCI-TM Provided` interface is mapped to the following interface:

```
// TCI-TM
// TE -> TM
package org.etsi.ttcn.tci;
public interface TciTMProvided {
    public void tciTestCaseStarted (TciTestCaseId testCaseId, TciParameterList parameterList, Float
timer);
    public void     tciTestCaseTerminated ( VerdictValue verdict, TciParameterList parameterList);
    public void     tciControlTerminated ();
    public Value    tciGetModulePar (TciModuleParameterId parameterId);
    public void     tciLog (TriComponentId testComponentId, String message);
```

```
    public void     tciError (String message);
}
```

8.4.1.2 TCI-TM required

The TCI-TM Required interface is mapped to the following interface:

```
// TCI-TM
// TM -> TE
package org.etsi.ttcn.tci;
public interface TciTMRequired {
    public void                     tciRootModule (TciModuleId moduleName) ;
    public TciModuleIdList        tciGetImportedModules ();
    public TciModuleParameterList   tciGetModuleParameters (TciModuleId moduleId);
    public TciTestCaseIdList        tciGetTestCases ();
    public TciParameterTypeList     tciGetTestCaseParameters (TciTestCaseId TestCaseId);
    public TriPortIdList            tciGetTestCaseTSI   (TciTestCaseId testCaseId);
    public void                     tciStartTestCase
                                    (String testCaseId, TciParameterList parameterList ) ;
    public void                     tciStopTestCase () ;
    public TriComponentId           tciStartControl () ;
    public void                     tciStopControl () ;
}
```

8.4.2 The TCI-CD interface

8.4.2.1 TCI-CD provided

The TCI-CD Provided interface is mapped to the following interface:

```
// TCI-CD
// TE -> CD
package org.etsi.ttcn.tci;
public interface TciCDProvided {
    public Value        decode (TriMessage message, Type decodingHypothesis );
    public TriMessage   encode (Value value);
}
```

8.4.2.2 TCI-CD required

The TCI-CD Required interface is mapped to the following interface:

```
// TCI-CD
// CD -> TE
package org.etsi.ttcn.tci;
public interface TciCDRequired {
    public Type     getTypeForName (String typeName);
    public Type     getInteger ();
    public Type     getFloat ();
    public Type     getBoolean ();
    public Type     getCharstring ();
    public Type     getUniversalCharstring ();
    public Type     getHexstring ();
    public Type     getBitstring ();
    public Type     getOctetstring ();
    public Type     getVerdict ();
    public void     tciErrorReq (String message);
}
```

8.4.3 The TCI-CH interface

8.4.3.1 TCI-CH provided

The TCI-CH Provided interface is mapped to the following interface:

```
// TciCHProvided
// TE -> CH
package org.etsi.ttcn.tci;
public interface TciCHProvided {
```

```
public void tciSendConnected    (TriPortId sender, TriComponentId receiver, Value sendMessage) ;
public void tciSendConnectedBC  (TriPortId sender, Value sendMessage) ;
public void tciSendConnectedMC  (TriPortId sender, TriComponentIdList receivers,
                                 Value sendMessage) ;

public void     tciCallConnected(TriPortId sender,
                                 TriComponentId receiver,
                                 TriSignatureId signature,
                                 TciParameterList parameterList) ;
public void     tciCallConnectedBC(TriPortId sender,
                                 TriSignatureId signature,
                                 TciParameterList parameterList) ;
public void     tciCallConnectedMC(TriPortId sender,
                                 TriComponentIdList receivers,
                                 TriSignatureId signature,
                                 TciParameterList parameterList) ;

public void     tciReplyConnected(TriPortId sender,
                                 TriComponentId receiver,
                                 TriSignatureId signature,
                                 TciParameterList parameterList,
                                 Value returnValue) ;
public void     tciReplyConnectedBC(TriPortId sender,
                                 TriSignatureId signature,
                                 TciParameterList parameterList,
                                 Value returnValue) ;
public void     tciReplyConnectedMC(TriPortId sender,
                                 TriComponentIdList receivers,
                                 TriSignatureId signature,
                                 TciParameterList parameterList,
                                 Value returnValue) ;

public void     tciRaiseConnected(TriPortId sender,
                                 TriComponentId receiver,
                                 TriSignatureId signature,
                                 Value except) ;
public void     tciRaiseConnectedBC(TriPortId sender,
                                 TriSignatureId signature,
                                 Value except) ;
public void     tciRaiseConnectedMC(TriPortId sender,
                                 TriComponentIdList receivers,
                                 TriSignatureId signature,
                                 Value except) ;

public TriComponentId   tciCreateTestComponentReq(int kind, Type componentType, String name) ;

public void     tciStartTestComponentReq(TriComponentId comp,
                                         TciBehaviourId behaviour,
                                         TciParameterList parameterList) ;

public void     tciStopTestComponentReq(TriComponentId comp) ;

public void     tciConnectReq(TriPortId fromPort, TriPortId toPort) ;

public void     tciDisconnectReq(TriPortId fromPort, TriPortId toPort) ;

public void     tciTestComponentTerminatedReq(TriComponentId comp, VerdictValue verdict) ;

public boolean  tciTestComponentRunningReq(TriComponentId comp) ;

public TriComponentId   tciGetMTCReq() ;

public void     tciMapReq(TriPortId fromPort, TriPortId toPort);

public void     tciUnmapReq(TriPortId fromPort, TriPortId toPort);

public void     tciExecuteTestCaseReq(TriComponentId testComponentId,
                                      TriPortIdList tsiPortList);

public void     tciResetReq() ;

public boolean  tciTestComponentDoneReq(TriComponentId testComponentId) ;

public void     tciKillTestComponentReq(TriComponentId component)

public boolean  tciTestComponentAliveReq (TriComponentId component)

public boolean  tciTestComponentKilledReq (TriComponentId component)
```

```
}
```

8.4.3.2 TCI-CH required

The `TCI-CH Required` interface is mapped to the following interface:

```
// TciCHRequired
// CH -> TE
package org.etsi.ttcn.tci;
public interface TciCHRequired extends TciCDRequired {
    public void     tciEnqueueMsgConnected(TriPortId sender,
                                           TriComponentId receiver,
                                           Value receivedMessage) ;

    public void     tciEnqueueCallConnected(TriPortId sender,
                                           TriComponentId receiver,
                                           TriSignatureId signature,
                                           TciParameterList parameterList) ;

    public void     tciEnqueueReplyConnected(TriPortId sender,
                                           TriComponentId receiver,
                                           TriSignatureId signature,
                                           TciParameterList parameterList,
                                           Value returnValue) ;

    public void     tciEnqueueRaiseConnected(TriPortId sender,
                                           TriComponentId receiver,
                                           TriSignatureId signature,
                                           Value except) ;

    public TriComponentId   tciCreateTestComponent(int kind, Type componentType, String name) ;

    public void     tciStartTestComponent(TriComponentId comp,
                                           TciBehaviourId behaviour,
                                           TciParameterList parameterList) ;

    public void     tciStopTestComponent(TriComponentId comp) ;

    public void     tciConnect(TriPortId fromPort, TriPortId toPort) ;

    public void     tciDisconnect(TriPortId fromPort, TriPortId toPort) ;

    public void     tciTestComponentTerminated(TriComponentId comp, VerdictValue verdict);

    public boolean  tciTestComponentRunning(TriComponentId comp);

    public boolean  tciTestComponentDone(TriComponentId comp);

    public TriComponentId   tciGetMTC ();

    public void     tciExecuteTestCase (TciTestCaseId TestCaseId, TriPortIdList tsiPortList);

    public void     tciReset ();

    public void     tciMap (TriPortId fromPort, TriPortId toPort);

    public void     tciUnmap (TriPortId fromPort, TriPortId toPort);

    public void         tciKillTestComponent(TriComponentId component)

    public boolean  tciTestComponentAlive (TriComponentId component)

    public boolean  tciTestComponentKilled (TriComponentId component)
}
```

8.4.4 The TCI-TL interface

8.4.4.1 TCI-TL provided

The `TCI-TL Provided` interface is mapped to the following interface:

```
// TCI-TL
// TE, TM,CH,CD, SA,PA -> TL
package org.etsi.ttcn.tci;
public interface TciTLProvided {
    public void tliTcExecute(String am, int ts, String src, int line, TriComponentId c,
            TciTestCaseId tcId, TriParameterList triPars, TriTimerDuration dur);
    public void tliTcStart(String am, int ts, String src, int line, TriComponentId c,
            TciTestCaseId tcId, TciParameterList tciPars, TriTimerDuration dur);
    public void tliTcStop(String am, int ts, String src, int line, TriComponentId c);
    public void tliTcStarted(String am, int ts, String src, int line, TriComponentId c,
            TciTestCaseId tcId, TciParameterList tciPars, TriTimerDuration dur);
    public void tliTcTerminated(String am, int ts, String src, int line, TriComponentId c,
            TciTestCaseId tcId, TciParameterList tciPars, VerdictValue verdict);
    public void tliCtrlStart(String am, int ts, String src, int line, TriComponentId c);
    public void tliCtrlStop(String am, int ts, String src, int line, TriComponentId c);
    public void tliCtrlTerminated(String am, int ts, String src, int line, TriComponentId c);
    public void tliMSend_m(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, Value msgValue, Value addrValue,
            TciStatus encoderFailure, TriMessage msg, TriAddress address,
            TriStatus transmissionFailure);
    public void tliMSend_m_BC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, Value msgValue
            TciStatus encoderFailure, TriMessage msg, TriStatus transmissionFailure);
    public void tliMSend_m_MC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, Value msgValue, TciValueList addrValues,
            TciStatus encoderFailure, TriMessage msg, TriAddressList addresses,
            TriStatus transmissionFailure);
    public void tliMSend_c(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, Value msgValue, TriStatus transmissionFailure);
    public void tliMSend_c_BC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortIdList to, Value msgValue, TriStatus transmissionFailure);
    public void tliMSend_c_MC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortIdList to, Value msgValue, TriStatus transmissionFailure);
    public void tliMDetected_m(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId from, TriMessage msg, TriAddress address);
    public void tliMDetected_c(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId from, Value msgValue );
    public void tliMMismatch_m(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, Value msgValue, TciValueTemplate msgTmpl, TciValueDifferenceList diffs,
            Value addrValue, TciValueTemplate addressTmpl);
    public void tliMMismatch_c(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, Value msgValue, TciValueTemplate msgTmpl, TciValueDifferenceList diffs,
            TriComponentId from, TciNonValueTemplate fromTmpl);
    public void tliMReceive_m(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, Value msgValue, TciValueTemplate msgTmpl,
            Value addrValue, TciValueTemplate addressTmpl);
    public void tliMReceive_c(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, Value msgValue, TciValueTemplate msgTmpl,
            TriComponentId from, TciNonValueTemplate fromTmpl);
    public void tliPrCall_m(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
            Value addrValue, TciStatus encoderFailure, TriParameterList triPars,
            TriAddress address, TriStatus transmissionFailure);
    public void tliPrCall_m_BC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
            TciStatus encoderFailure, TriParameterList triPars,
            TriStatus transmissionFailure);
    public void tliPrCall_m_MC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
            TciValueList addrValues, TciStatus encoderFailure, TriParameterList triPars,
            TriAddressList addresses, TriStatus transmissionFailure);
    public void tliPrCall_c(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
            TriStatus transmissionFailure);
    public void tliPrCall_c_BC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
            TriStatus transmissionFailure);
    public void tliPrCall_c_MC(String am, int ts, String src, int line, TriComponentId c,
            TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
            TriStatus transmissionFailure);
```

```
public void tliPrGetCallDetected_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature, TriParameterList triPars,
        TriAddress address);
public void tliPrGetCallDetected_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature, TciParameterList tciPars );
public void tliPrGetCallMismatch_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, TciValueTemplate parsTmpl, TciValueDifferenceList diffs,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrGetCallMismatch_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, TciValueTemplate parsTmpl, TciValueDifferenceList diffs,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrGetCall_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, TciValueTemplate parsTmpl,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrGetCall_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, TciValueTemplate parsTmpl,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrReply_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
        Value replValue, Value addrValue,
        TciStatus encoderFailure, TriParameterList triPars,
        TriParameter repl, TriAddress address, TriStatus transmissionFailure);
public void tliPrReply_m_BC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
        Value replValue, TciStatus encoderFailure,
        TriParameterList triPars, TriParameter repl, TriStatus transmissionFailure);
public void tliPrReply_m_MC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to, TriSignatureId signature, TciParameterList tciPars,
        Value replValue, TciValueList addrValues,
        TciStatus encoderFailure, TriParameterList triPars,
        TriParameter repl, TriAddressList addresses, TriStatus transmissionFailure);
public void tliPrReply_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to, TriSignatureId signature,
        TciParameterList tciPars, Value replValue,
        TriStatus transmissionFailure);
public void tliPrReply_c_BC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
        Value replValue, TriStatus transmissionFailure);
public void tliPrReply_c_MC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
        Value replValue, TriStatus transmissionFailure);
public void tliPrGetReplyDetected_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature, in TriParameterListType triPars,
        TriParameter repl, TriAddress address);
public void tliPrGetReplyDetected_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature, in TciParameterList tciPars,
        Value replValue);
public void tliPrGetReplyMismatch_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, in TciValueTemplate parsTmpl,
        Value replValue, TciValueTemplate replyTmpl,  TciValueDifferenceList diffs,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrGetReplyMismatch_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, in TciValueTemplate parsTmpl,
        Value replValue, TciValueTemplate replyTmpl,  TciValueDifferenceList diffs,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrGetReply_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, in TciValueTemplate parsTmpl,
        Value replValue, TciValueTemplate replyTmpl,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrGetReply_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        TciParameterList tciPars, in TciValueTemplate parsTmpl,
        Value replValue, TciValueTemplate replyTmpl,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrRaise_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to,
        TriSignatureId signature, TciParameterList tciPars, Value excValue,
        Value addrValue, TciStatus encoderFailure, TriException exc,
        TriAddress address, TriStatus transmissionFailure);
```

```
public void tliPrRaise_m_BC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to,
        TriSignatureId signature, TciParameterList tciPars, Value excValue,
        TciStatus encoderFailure, TriException exc, TriStatus transmissionFailure);
public void tliPrRaise_m_MC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to,
        TriSignatureId signature, TciParameterList tciPars, Value excValue,
        TciValueList addrValues, TciStatus encoderFailure, TriException exc,
        TriAddressList addresses, TriStatus transmissionFailure);
public void tliPrRaise_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId to, TriSignatureId signature,
        TciParameterList tciPars, Value excValue, TriStatus transmissionFailure);
public void tliPrRaise_c_BC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
        Value excValue, TriStatus transmissionFailure);
public void tliPrRaise_c_MC(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortIdList to, TriSignatureId signature, TciParameterList tciPars,
        Value excValue, TriStatus transmissionFailure);
public void tliPrCatchDetected_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature,
        TriException exc, TriAddress address);
public void tliPrCatchDetected_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriPortId from, TriSignatureId signature,
        Value excValue);
public void tliPrCatchMismatch_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        Value excValue, TciValueTemplate excTmpl,  TciValueDifferenceList diffs,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrCatchMismatch_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        Value excValue, TciValueTemplate excTmpl,  TciValueDifferenceList diffs,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrCatch_m(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        Value excValue, TciValueTemplate excTmpl,
        Value addrValue, TciValueTemplate addressTmpl);
public void tliPrCatch_c(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature,
        Value excValue, TciValueTemplate excTmpl,
        TriComponentId from, TciNonValueTemplate fromTmpl);
public void tliPrCatchTimeoutDetected(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature);
public void tliPrCatchTimeout(String am, int ts, String src, int line, TriComponentId c,
        TriPortId at, TriSignatureId signature);
public void tliCCreate(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, String name, Boolean alive);
public void tliCStart(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, TciBehaviourId name, TciParameterList tciPars);
public void tliCRunning(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, ComponentStatus status);
public void tliCAlive(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, ComponentStatus status);
public void tliCStop(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp);
public void tliCKill(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp);
public void tliCDoneMismatch(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, TciNonValueTemplate compTmpl);
public void tliCDone(String am, int ts, String src, int line, TriComponentId c,
        TciNonValueTemplate compTmpl);
public void tliCKilledMismatch(String am, int ts, String src, int line, TriComponentId c,
        TriComponentId comp, TciNonValueTemplate compTmpl);
public void tliCKilled(String am, int ts, String src, int line, TriComponentId c,
        TciNonValueTemplate compTmpl);
public void tliCTerminated(String am, int ts, String src, int line, TriComponentId c,
        VerdictValue verdict);
public void tliPConnect(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port1, TriPortId port2);
public void tliPDisconnect(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port1, TriPortId port2);
public void tliPMap(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port1, TriPortId port2);
public void tliPUnmap(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port1, TriPortId port2);
public void tliPClear(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port);
public void tliPStart(String am, int ts, String src, int line, TriComponentId c,
        TriPortId port);
```

```
    public void tliPStop(String am, int ts, String src, int line, TriComponentId c,
            TriPortId port);
    public void tliPHalt(String am, int ts, String src, int line, TriComponentId c,
            TriPortId port);
    public void tliEncode(String am, int ts, String src, int line, TriComponentId c,
            Value val, TciStatus encoderFailure, TriMessage msg, String codec);
    public void tliDecode(String am, int ts, String src, int line, TriComponentId c,
            TriMessage msg, TciStatus decoderFailure, Value val, String codec);
    public void tliTTimeoutDetected(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer);
    public void tliTTimeoutMismatch(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, TciNonValueTemplate timerTmpl);
    public void tliTTimeout(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, TciNonValueTemplate timerTmpl);
    public void tliTStart(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, TriTimerDuration dur);
    public void tliTStop(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, in TriTimerDuration dur);
    public void tliTRead(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, TriTimerDuration elapsed);
    public void tliTRunning(String am, int ts, String src, int line, TriComponentId c,
            TriTimerId timer, TimerStatus status);
    public void tliSEnter(String am, int ts, String src, int line, TriComponentId c,
            QualifiedName name, TciParameterList tciPars, String kind);
    public void tliSLeave(String am, int ts, String src, int line, TriComponentId c,
            QualifiedName name, TciParameterList tciPars, Value returnValue, String kind);
    public void tliVar(String am, int ts, String src, int line, TriComponentId c,
            QualifiedName name, Value varValue);
    public void tliModulePar(String am, int ts, String src, int line, TriComponentId c,
            QualifiedName name, Value parValue);
    public void tliGetVerdict(String am, int ts, String src, int line, TriComponentId c,
            VerdictValue verdict);
    public void tliSetVerdict(String am, int ts, String src, int line, TriComponentId c,
            VerdictValue verdict, String reason);
    public void tliLog(String am, int ts, String src, int line, TriComponentId c,
            TString log);
    public void tliAEnter(String am, int ts, String src, int line, TriComponentId c);
    public void tliALeave(String am, int ts, String src, int line, TriComponentId c);
    public void tliADefaults(String am, int ts, String src, int line, TriComponentId c);
    public void tliAActivate(String am, int ts, String src, int line, TriComponentId c,
            QualifiedName name, TciParameterList tciPars, Value ref);
    public void tliADeactivate(String am, int ts, String src, int line, TriComponentId c,
            Value ref);
    public void tliANomatch(String am, int ts, String src, int line, TriComponentId c);
    public void tliARepeat(String am, int ts, String src, int line, TriComponentId c);
    public void tliAWait(String am, int ts, String src, int line, TriComponentId c);
    public void tliAction(String am, int ts, String src, int line, TriComponentId c, String action);
    public void tliMatch(String am, int ts, String src, int line, TriComponentId c, Value expr,
            TciValueTemplate tmpl);
    public void tliMatchMismatch(String am, int ts, String src, int line, TriComponentId c,
            Value expr, TciValueTemplate tmpl, TciValueDifferenceList diffs);
    public void tliInfo (String am, int ts, String src, int line, TriComponent c,
            int level, String info)
}
```

8.5 Optional parameters

Clause 7.3 defines that a reserved value shall be used to indicate the absence of an optional parameter. For the Java language mapping the Java `null` value shall be used to indicate the absence of an optional value. For example, if in the `tciReplyConnected` operation the value parameter shall be omitted the operation invocation shall be `tciReplyConnected (sender, receiver, signature, parameterList, null)`.

8.6 TCI initialization

All methods are non-static, i.e. operations can only be called on objects. As the present document does not define concrete implementation strategies of TE, TM, CD and CH the mechanism how the TE, the TM, the CD or the CH get to know the handles on the respective objects is out of scope of the present document.

Tool vendors shall provide methods to the developers of TM, CD and CH to register the TE, TM, CD and CH to their respective communication partner.

8.7 Error handling

All operations called from the TM, CH or CD that return have succeeded. If an erroneous situation has been identified by the TE a test case error will be communicated to the user using the procedures as defined in clause 7.3.1.2.6 (`tciError`). If an operation called by the TE in the TM, CH, CD, or TL produces an error, this erroneous situation should be communicated to the TE using the procedures as defined in clause 7.3.2.1.12 (`tciErrorReq`).

Beside this error handling no additional error handling is defined with this Java language mapping. In particular, no exception handling mechanisms are defined.

9 ANSI C language mapping

9.1 Introduction

This clause defines the TRI ANSI-C language mapping for the TCI data specified in clause 7.2 and for the TCI operations specified in clause 7.3.

9.2 Value interfaces

TCI IDL Interface	ANSI C representation	Notes and comments
Type		
TciModuleIdType getDefiningModule()	`TciModuleIdType tciGetDefiningModule(Type inst)`	
TString getName()	`String tciGetName(Type inst)`	String type reused from IDL (OMG recommendation)
TciTypeClassType getTypeClass()	`TciTypeClassType tciGetTypeClass (Type inst)`	
Value newInstance()	`Value tciNewInstance(Type inst)`	
TString getTypeEncoding()	`String tciGetTypeEncoding(Type inst)`	
TStringSeq getTypeExtension()	`String* getTypeExtension(Type inst)`	
TString getTypeEncodingVariant()	`String tciGetTypeEncodingVariant(Type inst)`	
Value		
TString getValueEncoding()	`String tciGetValueEncoding(Value inst)`	
TString getValueEncodingVariant()	`String tciGetValueEncodingVariant(Value inst)`	
Type getType()	`Type tciGetType(Value inst)`	
TBoolean notPresent()	`Boolean tciNotPresent(Value inst)`	Boolean type reused from IDL (OMG recommendation)
	`void tciSetNull(Value inst)`	For optional parameters of operations, see clause 9.7.
	`Boolean tciIsNull(Value inst)`	For optional parameters of operations, see clause 9.7. Boolean type reused from IDL (OMG recommendation)
IntegerValue		
TInteger getInt()	`String tciGetIntAbs(Value inst)`	Returns the (10-base) integer absolute value as an ASCII string.

TCI IDL Interface	ANSI C representation	Notes and comments
	`unsigned long int tciGetIntNumberOfDigits (Value inst)`	Returns the number of digits in an integer value.
	`Boolean tciGetIntSign(Value inst)`	Returns true if the number is positive, false otherwise.
	`char tciGetIntDigit (Value inst, unsigned long int position)`	Returns the value of the digit at position 'position', where position 0 is the least significant digit.
void setInt(in TInteger value)	`void tciSetIntAbs(Value inst, String value)`	Sets the (10-base) absolute value of the integer via an ASCII string. The first digit must not be 0 unless the value is 0.
	`void tciSetIntNumberOfDigits (Value inst, unsigned long int dig_num)`	Sets the number of digits in an integer value.
	`void tciSetIntSign (Value inst, Boolean sign)`	Sets the sign to + (true) or - (false).
	`void tciSetIntDigit (Value inst, unsigned long int position, char digit)`	Sets the value of the digit at position 'position', where position 0 is the least significant digit.
FloatValue		
TFloat getFloat()	`double tciGetFloatValue(Value inst)`	
void setFloat(in TFloat value)	`void tciSetFloatValue(Value inst, double value)`	
BooleanValue		
TBoolean getBoolean()	`Boolean tciGetBooleanValue(Value inst)`	
void setBoolean (in TBoolean value)	`void tciSetBooleanValue (Value inst, Boolean value)`	
CharstringValue		
TString getString()	`TciCharStringValue tciGetCStringValue(Value inst)`	
void setString(in TString value)	`void tciSetCStringValue (Value inst, TciCharStringValue value)`	
TChar getChar (in TInteger position)	`char tciGetCStringCharValue (Value inst, long int position)`	
void setChar (in TInteger position, in char value)	`void tciSetCStringCharValue (Value inst, long int position, char value)`	
TInteger getLength()	`unsigned long int tciGetCStringLength (Value inst)`	
void setLength(in TInteger len)	`void tciSetCStringLength (Value inst, unsigned long int len)`	
UniversalCharstringValue		
TString getString()	`TciUCStringValue tciGetUCStringValue(Value inst)`	
void setString(in TString value)	`void tciSetUCStringValue (Value inst, TciUCStringValue value)`	
TUniversalChar getChar (in TInteger position)	`void tciGetUCStringCharValue (Value inst, unsigned long int position, TciUCValue result)`	
void setChar (in TInteger position, in TUniversalChar value)	`void tciSetUCStringCharValue (Value inst, unsigned long int position, TciUCValue value)`	
TInteger getLength()	`unsigned long int tciGetUCStringLength(Value inst)`	

TCI IDL Interface	ANSI C representation	Notes and comments
void setLength(in TInteger len)	`void tciSetUCStringLength (Value inst, unsigned long int len)`	
BitstringValue		
TString getString()	`String tciGetBStringValue(Value inst)`	
void setString(in TString value)	`void tciSetBStringValue (Value inst, String value)`	
TChar getBit (in integer position)	`int tciGetBStringBitValue (Value inst, long int position)`	
void setBit (in TInteger position, in TInteger value)	`void tciSetBStringBitValue (Value inst, unsigned long int position, int value)`	
TInteger getLength()	`unsigned long int tciGetBStringLength(Value inst)`	
void setLength(in TInteger len)	`void tciSetBStringLength (Value inst, long int len)`	
HexstringValue		
TString getString()	`String tciGetHStringValue(Value inst)`	
void setString(in TString value)	`void tciSetHStringValue (Value inst, String value)`	
TChar getHex (in TInteger position)	`int tciGetHStringHexValue (Value inst, unsigned long int position)`	
void setBit (in TInteger position, in TInteger value)	`void tciSetHStringHexValue (Value inst, unsigned long int position, int value)`	
TInteger getLength()	`long int tciGetHStringLength(Value inst)`	
void setLength(in TInteger len)	`void tciSetHStringLength (Value inst, unsigned long int len)`	
OctetstringValue		
TString getString()	`String tciGetOStringValue(Value inst)`	
void setString(in TString value)	`void tciSetOStringValue (Value inst, String value)`	
TChar getOctet(in TInteger position)	`int tciGetOStringOctetValue (Value inst, unsigned long int position)`	
void setOctet (in TInteger position, in TInteger value)	`void tciSetOStringOctetValue (Value inst, unsigned long int position, int value)`	
TInteger getLength()	`unsigned long int tciGetOStringLength(Value inst)`	
void setLength(in TInteger len)	`void tciSetOStringLength (Value inst, unsigned long int len)`	
RecordValue		
Value getField(in TString fieldName)	`Value tciGetRecFieldValue (Value inst, String fieldName)`	
void setField (in TString fieldName, in Value value)	`void tciSetRecFieldValue (Value inst, String fieldName, Value value)`	
TString[] getFieldNames()	`char** tciGetRecFieldNames(Value inst)`	Returns a NULL-terminated array of the field names.
void setFieldOmitted (in TString fieldName)	`void setFieldOmitted (Value inst, String fieldName)`	
RecordOfValue		
Value getField(in TInteger position)	`Value tciGetRecOfFieldValue (Value inst, unsigned long int position)`	
void setField (in TInteger position, in Value value)	`void tciSetRecOfFieldValue (Value inst, unsigned long int position, Value value)`	
void appendField(in Value value)	`void tciAppendRecOfFieldValue (Value inst, Value value)`	

TCI IDL Interface	ANSI C representation	Notes and comments
Type getElementType()	`Type tciGetRecOfElementType(Value inst)`	
TInteger getLength()	`unsigned long int tciGetRecOfLength(Value inst)`	
void setLength(in TInteger len)	`void tciSetRecOfLength (Value inst, unsigned long int len)`	
TInteger getOffset()	`unsigned long int tciGetOffset(Value inst)`	
UnionValue		
Value getVariant (in TString variantName)	`Value tciGetUnionVariant (Value inst, String variantName)`	
void setVariant (in TString variantName, in Value value)	`void tciSetUnionVariant (Value inst, String variantName, Value value)`	
TString getPresentVariantName()	`String tciGetUnionPresentVariantName (Value inst)`	
TString[] getVariantNames()	`char** tciGetUnionVariantNames(Value inst)`	Returns a NULL-terminated array of the field names.
EnumeratedValue		
TString getEnum()	`String tciGetEnumValue(Value inst)`	
void setEnum(in TString enumValue)	`void tciSetEnumValue (Value inst, String enumValue)`	
VerdictValue		
TInteger getVerdict()	`int tciGetVerdictValue(Value inst)`	
void setVerdict(in TInteger verdict)	`void tciSetVerdictValue(Value inst, int verdict)`	
AddressValue		
Value getAddress()	`Value tciGetAddressValue(Value inst)`	
void setAddress(in Value value)	`void tciSetAddressValue(Value inst, Value value)`	

9.3 Logging interface

TCI IDL Interface	ANSI C representation	Notes and comments
TciValueTemplate		
TBoolean isOmit()	`Boolean tciIsOmit(TciValueTemplate inst)`	Boolean type reused from IDL (OMG recommendation)
TBoolean isAny()	`Boolean tciIsAny(TciValueTemplate inst)`	Boolean type reused from IDL (OMG recommendation)
TBoolean isAnyOrOmit()	`Boolean tciIsAnyOrOmit(TciValueTemplate inst)`	Boolean type reused from IDL (OMG recommendation)
TString getTemplateDef()	`String tciGetTemplateDef(TciValueTemplate inst)`	String type reused from IDL (OMG recommendation)
TciNonValueTemplate		
TBoolean isAny()	`Boolean tciIsAnyNonValue (TciNonValueTemplate inst)`	Boolean type reused from IDL (OMG recommendation)
TBoolean isAll()	`Boolean tciIsAllNonValue (TciNonValueTemplate inst)`	Boolean type reused from IDL (OMG recommendation)
TString getTemplateDef()	`String tciGetTemplateDefNonValue (TciNonValueTemplate inst)`	String type reused from IDL (OMG recommendation)
TciValueList		
TInteger size()	`int size(TciValueList inst)`	
TBoolean isEmpty()	`Boolean isEmpty(TciValueList inst)`	Boolean type reused from IDL (OMG recommendation)
Value get(TInteger index)	`Value get(TciValueList inst, int index)`	

TCI IDL Interface	ANSI C representation	Notes and comments
TciValueDifference		
Value getValue()	`Value getValue(TciValueDifference inst)`	
TciValueTemplate getTciValueTemplate()	`TciValueTemplate getTciValueTemplate(TciValueDifference inst)`	
TString getDescription()	`String getDescription(TciValueDifference inst)`	String type reused from IDL (OMG recommendation)
TciValueDifferenceList		
TInteger size()	`int size(TciValueDifferenceList inst)`	
TBoolean isEmpty()	`Boolean isEmpty(TciValueDifferenceList inst)`	Boolean type reused from IDL (OMG recommendation)
TciValueDifference get(TInteger index)	`TciValueDifference get(TciValueDifferenceList inst, int index)`	

9.4 Operation interfaces

9.4.1 The TCI-TM interface

9.4.1.1 TCI-TM provided

The `TCI-TM Provided` interface is mapped to the following interface:

```
void tciTestCaseStarted
    (TciTestCaseIdType testCaseId, TciParameterListType parameterList, double timer)
void tciTestCaseTerminated (VerdictValue verdict,  TciParameterListType parameterlist)
void tciControlTerminated()
Value tciGetModulePar (TciModuleParameterIdType parameterId)
void tciLog(String message)
void tciError(String message)
```

9.4.1.2 TCI-TM required

The `TCI-TM Required` interface is mapped to the following interface:

```
void tciRootModule(String moduleId)
TciModuleIdListType tciGetImportedModules()
TciModuleParameterListType tciGetModuleParameters(TciModuleIdType moduleName)
TciTestCaseIdListType tciGetTestCases()
TciParameterTypeListType tciGetTestCaseParameters (TciTestCaseIdType testCaseId)
TriPortIdList tciGetTestCaseTSI (TciTestCaseIdType testCaseId)
void tciStartTestCase (TciTestCaseIdType testCaseId, TciParameterListType parameterlist)
void tciStopTestCase()
TriComponentId tciStartControl()
void tciStopControl()
```

9.4.2 The TCI-CD interface

9.4.2.1 TCI-CD provided

The `TCI-CD Provided` interface is mapped to the following interface:

```
Value tciDecode (BinaryString message, Type decHypothesis)
BinaryString tciEncode(Value value)
```

NOTE: BinaryString type reused from TRI.

9.4.2.2 TCI-CD required

The `TCI-CD Required` interface is mapped to the following interface:

```
Type tciGetTypeForName(String typeName)
Type tciGetIntegerType()
Type tciGetFloatType()
Type tciGetBooleanType()
Type tciGetCharType()
Type tciGetUniversalCharType()
Type tciGetTciCharstringType()
Type tciGetUniversalCharstringType()
Type tciGetHexstringType()
Type tciGetBitstringType()
Type tciGetOctetstringType()
Type tciGetVerdictType()
void    tciErrorReq(String message)
```

9.4.3 The TCI-CH interface

9.4.3.1 TCI-CH provided

The `TCI-CH Provided` interface is mapped to the following interface:

```
void           tciSendConnected(TriPortId sender, TriComponentId receiver, Value sendMessage)
void           tciSendConnectedBC(TriPortId sender, Value sendMessage)
void           tciSendConnectedMC
 (TriPortId sender, TriComponentIdList receivers, Value sendMessage)
void           tciCallConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature,
  TciParameterListType parameterList)
void           tciCallConnectedBC
 (TriPortId sender, TriSignatureId signature, TciParameterListType parameterList)
void           tciCallConnectedMC
 (TriPortId sender, TriComponentIdList receivers, TriSignatureId signature,
  TciParameterListType parameterList)
void           tciReplyConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature,
  TciParameterListType parameterList, Value returnValue)
void           tciReplyConnectedBC
 (TriPortId sender, TriSignatureId signature, TciParameterListType parameterList,
  Value returnValue)
void           tciReplyConnectedMC
 (TriPortId sender, TriComponentIdList receivers, TriSignatureId signature,
  TciParameterListType parameterList, Value returnValue)
void           tciRaiseConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature, Value exception)
void           tciRaiseConnectedBC
 (TriPortId sender, TriSignatureId signature, Value exception)
void           tciRaiseConnectedMC
 (TriPortId sender, TriComponentIdList receivers, TriSignatureId signature, Value exception)
TriComponentId tciCreateTestComponentReq
 (TciTestComponentKindType kind, Type componentType, String name)
void           tciStartTestComponentReq
 (TriComponentId component, TciBehaviourIdType behaviour, TciParameterListType parameterList)
void           tciStopTestComponentReq (TriComponentId component)
void           tciConnectReq(TriPortId fromPort, TriPortId toPort)
void           tciDisconnectReq(TriPortId fromPort, TriPortId toPort)
void           tciMapReq(TriPortId fromPort, TriPortId toPort)
void           tciUnmapReq(TriPortId fromPort, TriPortId toPort)
void           tciTestComponentTerminatedReq(TriComponentId component, VerdictValue verdict)
Boolean        tciTestComponentRunningReq(TriComponentId component)
Boolean        tciTestComponentDoneReq(TriComponentId component)
TriComponentId tciGetMTCReq()
void           tciExecuteTestCaseReq(TciTestCaseIdType testCaseId, TriPortIdList tsiPortList)
void           tciResetReq()
void           tciKillTestComponentReq(TriComponentId component)
Boolean        tciTestComponentAliveReq (TriComponentId component)
Boolean        tciTestComponentKilledReq (TriComponentId component)
```

9.4.3.2 TCI-CH required

The `TCI-CH Required` interface is mapped to the following interface:

```
void           tciEnqueueMsgConnected
 (TriPortId sender, TriComponentId receiver, Value rcvdMessage)
void           tciEnqueueCallConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature,
  TciParameterListType parameterList)
void           tciEnqueueReplyConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature,
  TciParameterListType parameterList, Value returnValue)
void           tciEnqueueRaiseConnected
 (TriPortId sender, TriComponentId receiver, TriSignatureId signature, Value exception)
TriComponentId tciCreateTestComponent
 (TciTestComponentKindType kind, Type componentType, String name)
void           tciStartTestComponent
 (TriComponentId component, TciBehaviourIdType behaviour, TciParameterListType parameterList)
void           tciStopTestComponent(TriComponentId component)
void           tciConnect(TriPortId fromPort, TriPortId toPort)
void           tciDisconnect(TriPortId fromPort, TriPortId toPort)
void           tciMap (TriPortId fromPort, TriPortId toPort)
void           tciUnmap(TriPortId fromPort, TriPortId toPort)
void           tciTestComponentTerminated(TriComponentId component, VerdictValue verdict)
Boolean        tciTestComponentRunning(TriComponentId component)
Boolean        tciTestComponentDone(TriComponentId component)
TriComponentId tciGetMTC()
void           tciExecuteTestCase(TciTestCaseIdType testCaseId, TriPortIdList tsiPortList)
void           tciReset()
void           tciKillTestComponent(TriComponentId component)
Boolean        tciTestComponentAlive(TriComponentId component)
Boolean        tciTestComponentKilled(TriComponentId component)
```

9.4.4 The TCI-TL interface

9.4.4.1 TCI-TL provided

The `TCI-TL Provided` interface is mapped to the following interface:

```
void tliTcExecute
 (String am, int ts, String src, int line, TriComponentId c, TciTestCaseIdType tcId,
  TciParameterListType tciPars, TriTimerDuration dur)
void tliTcStart
 (String am, int ts, String src, int line, TriComponentId c, TciTestCaseIdType tcId,
  TciParameterListType tciPars, TriTimerDuration dur)
void tliTcStop
 (String am, int ts, String src, int line, TriComponentId c)
void tliTcStarted
 (String am, int ts, String src, int line, TriComponentId c, TciTestCaseIdType tcId,
  TciParameterListType tciPars, TriTimerDuration dur)
void tliTcTerminated
 (String am, int ts, String src, int line, TriComponentId c, TciTestCaseIdType tcId,
  TciParameterListType tciPars, VerdictValue verdict)

void tliCtrlStart(String am, int ts, String src, int line, TriComponentId c)
void tliCtrlStop(String am, int ts, String src, int line, TriComponentId c)
void tliCtrlTerminated(String am, int ts, String src, int line, TriComponentId c)

void tliMSend_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  Value msgValue, Value addrValue, TciStatus encoderFailure, TriMessage msg,
  TriAddress address, TriStatus transmissionFailure)
void tliMSend_m_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  Value msgValue, TciStatus encoderFailure, TriMessage msg, TriStatus transmissionFailure)
void tliMSend_m_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  Value msgValue, TciValueList addrValues, TciStatus encoderFailure, TriMessage msg,
  TriAddressList addresses, TriStatus transmissionFailure)
void tliMSend_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  Value msgValue, TriStatus transmissionFailure)
void tliMSend_c_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  Value msgValue, TriStatus transmissionFailure)
```

```
void tliMSend_c_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  Value msgValue, TriStatus transmissionFailure)
void tliMDetected_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriMessage msg, TriAddress address)
void tliMDetected_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  Value msgValue)
void tliMMismatch_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, Value msgValue,
  TciValueTemplate msgTmpl, TciValueDifferenceList diffs, Value addrValue,
  TciValueTemplate addressTmpl)
void tliMMismatch_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, Value msgValue,
  TciValueTemplate msgTmpl, TciValueDifferenceList diffs, TriComponentId from,
  TciNonValueTemplate fromTmpl)
void tliMReceive_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, Value msgValue,
  TciValueTemplate msgTmpl, Value addrValue, TciValueTemplate addressTmpl)
void tliMReceive_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, Value msgValue,
  TciValueTemplate msgTmpl, TriComponentId from, TciNonValueTemplate fromTmpl)

void tliPrCall_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at,
  TriPortId to, TriSignatureId signature,
  TciParameterListType tciPars, Value addrValue, TciStatus encoderFailure,
  TriParameterList triPars, TriAddress address, TriStatus transmissionFailure)
void tliPrCall_m_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, TciStatus encoderFailure,
  TriParameterList triPars, TriStatus transmissionFailure)
void tliPrCall_m_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, TciValueList addrValues,
  TciStatus encoderFailure, TriParameterList triPars, TriAddressList addresses,
  TriStatus transmissionFailure)
void tliPrCall_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at,
  TriPortId to, TriSignatureId signature,
  TciParameterListType tciPars, TriStatus transmissionFailure)
void tliPrCall_c_BC
 (String am, int ts, String srcint line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, TriStatus transmissionFailure)
void tliPrCall_c_MC
 (String am, int ts, String srcint line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, TriStatus transmissionFailure)
void tliPrGetCallDetected_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, TriParameterList triPars, TriAddress address)
void tliPrGetCallDetected_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, TciParameterListType tciPars)
void tliPrGetCallMismatch_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, TciValueDifferenceList diffs,
  Value addrValue, TciValueTemplate addressTmpl)
void tliPrGetCallMismatch_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, TciValueDifferenceList diffs,
  TriComponentId from, TciNonValueTemplate fromTmpl)
void tliPrGetCall_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, Value addrValue,
  TciValueTemplate addressTmpl)
void tliPrGetCall_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, TriComponentId from,
  TciNonValueTemplate fromTmpl)
void tliPrReply_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  Value addrValue, TciStatus encoderFailure, TriParameterList triPars,
  TriParameter repl, TriAddress address, TriStatus transmissionFailure)
```

```
void tliPrReply_m_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  TciStatus encoderFailure, TriParameterList triPars, TriParameter repl,
  TriStatus transmissionFailure)
void tliPrReply_m_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  TciValueList addrValues, TriStatus encoderFailure, TriParameterList triPars,
  TriParameter repl, TriAddressList addresses, TciStatus transmissionFailure)
void tliPrReply_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  TriStatus transmissionFailure)
void tliPrReply_c_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  TriStatus transmissionFailure)
void tliPrReply_c_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue,
  TriStatus transmissionFailure)
void tliPrGetReplyDetected_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, TriParameterList triPars, TriParameter repl, TriAddress address)
void tliPrGetReplyDetected_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, TciParameterListType tciPars, Value replValue)
void tliPrGetReplyMismatch_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, Value replValue,
  TciValueTemplate replyTmpl, TciValueDifferenceList diffs, Value addrValue,
  TciValueTemplate addressTmpl)
void tliPrGetReplyMismatch_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, Value replValue,
  TciValueTemplate replyTmpl, TciValueDifferenceList diffs, TriComponentId from,
  TciNonValueTemplate fromTmpl)
void tliPrGetReply_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, Value replValue,
  TciValueTemplate replyTmpl, Value addrValue, TciValueTemplate addressTmpl)
void tliPrGetReply_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  TciParameterListType tciPars, TciValueTemplate parsTmpl, Value replValue,
  TciValueTemplate replyTmpl, TriComponentId from, TciNonValueTemplate fromTmpl)
void tliPrRaise_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue, Value addrValue,
  TciStatus encoderFailure, TriException exc, TriAddress address, TriStatus transmissionFailure)
void tliPrRaise_m_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue,
  TciStatus encoderFailure, TriException exc, TriStatus transmissionFailure)
void tliPrRaise_m_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue,
  TciValueList addrValues, TciStatus encoderFailure, TriException exc,
  TriAddressList addresses, TriStatus transmissionFailure)
void tliPrRaise_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue,
  TriStatus transmissionFailure)
void tliPrRaise_c_BC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue,
  TriStatus transmissionFailure)
void tliPrRaise_c_MC
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortIdList to,
  TriSignatureId signature, TciParameterListType tciPars, Value excValue,
  TriStatus transmissionFailure)
void tliPrCatchDetected_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, TriException exc, TriAddress address)
void tliPrCatchDetected_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriPortId from,
  TriSignatureId signature, Value excValue)
```

```
void tliPrCatchMismatch_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  Value excValue, TciValueTemplate excTmpl, TciValueDifferenceList diffs, Value addrValue,
  TciValueTemplate addressTmpl)
void tliPrCatchMismatch_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  Value excValue, TciValueTemplate excTmpl, TciValueDifferenceList diffs, TriComponentId from,
  TciNonValueTemplate fromTmpl)
void tliPrCatch_m
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  Value excValue, TciValueTemplate excTmpl, Value addrValue, TciValueTemplate addressTmpl)
void tliPrCatch_c
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature,
  Value excValue, TciValueTemplate excTmpl, TriComponentId from, TciNonValueTemplate fromTmpl)
void tliPrCatchTimeoutDetected
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature)
void tliPrCatchTimeout
 (String am, int ts, String src, int line, TriComponentId c, TriPortId at, TriSignatureId signature)

void tliCCreate
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp, String name,
  Boolean alive)
void tliCStart
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp,
  TciBehaviourIdType name, TciParameterListType tciPars)
void tliCRunning
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp,
  ComponentStatus status)
void tliCAlive
  (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp,
   ComponentStatus status)
void tliCStop
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp)
void tliCKill
  (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp)
void tliCDoneMismatch
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp,
  TciNonValueTemplate compTmpl)
void tliCDone
 (String am, int ts, String src, int line, TriComponentId c, TciNonValueTemplate compTmpl)
void tliCTerminated
 (String am, int ts, String src, int line, TriComponentId c, VerdictValue verdict)
void tliCKilledMismatch
 (String am, int ts, String src, int line, TriComponentId c, TriComponentId comp,
  TciNonValueTemplate compTmpl)
void tliCKilled
 (String am, int ts, String src, int line, TriComponentId c, TciNonValueTemplate compTmpl)

void tliPConnect
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port1, TriPortId port2)
void tliPDisconnect
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port1,
  TriPortId port2)
void tliPMap
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port1, TriPortId port2)
void tliPUnmap
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port1,
  TriPortId port2)
void tliPClear
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port)
void tliPStart
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port)
void tliPStop
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port)
void tliPHalt
 (String am, int ts, String src, int line, TriComponentId c, TriPortId port)

void tliEncode
 (String am, int ts, String src, int line, TriComponentId c, Value val, TciStatus encoderFailure,
  TriMessage msg, String codec)
void tliDecode
 (String am, int ts, String src, int line, TriComponentId c, TriMessage msg,
  TciStatus decoderFailure, Value val, String codec)

void tliTTimeoutDetected
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer)
```

```
void tliTTimeoutMismatch
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer,
  TciNonValueTemplate timerTmpl)
void tliTTimeout
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer,
  TciNonValueTemplate timerTmpl)
void tliTStart
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer, TriTimerDuration dur)
void tliTStop
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer, TriTimerDuration dur)
void tliTRead
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer,
  TriTimerDuration elapsed)
void tliTRunning
 (String am, int ts, String src, int line, TriComponentId c, TriTimerId timer, TimerStatus status)

void tliSEnter
 (String am, int ts, String src, int line, TriComponentId c,QualifiedName name,
  TciParameterListType tciPars, String kind)
void tliSLeave
 (String am, int ts, String src, int line, TriComponentId c,QualifiedName name,
  TciParameterListType tciPars, Value returnValue, String kind)

void tliVar
 (String am, int ts, String src, int line, TriComponentId c,QualifiedName name, Value varValue)
void tliModulePar
 (String am, int ts, String src, int line, TriComponentId c,QualifiedName name, Value parValue)

void tliGetVerdict(String am, int ts, String src, int line, TriComponentId c, VerdictValue verdict)
void tliSetVerdict
 (String am, int ts, String src, int line, TriComponentId c, VerdictValue verdict, String reason)

void tliLog(String am, int ts, String src, int line, TriComponentId c, String log)

void tliAEnter(String am, int ts, String src, int line, TriComponentId c)
void tliALeave(String am, int ts, String src, int line, TriComponentId c)
void tliADefaults(String am, int ts, String src, int line, TriComponentId c)
void tliAActivate
 (String am, int ts, String src, int line, TriComponentId c,QualifiedName name,
  TciParameterListType tciPars, Value ref)
void tliADeactivate(String am, int ts, String src, int line, TriComponentId c, Value ref)
void tliANomatch(String am, int ts, String src, int line, TriComponentId c)
void tliARepeat(String am, int ts, String src, int line, TriComponentId c)
void tliAWait(String am, int ts, String src, int line, TriComponentId c)

void tliAction(String am, int ts, String src, int line, TriComponentId c, String action)

void tliMatch
 (String am, int ts, String src, int line, TriComponentId c, Value expr, TciValueTemplate tmpl)
void tliMatchMismatch
 (String am, int ts, String src, int line, TriComponentId c, Value expr, TciValueTemplate tmpl,
  TciValueDifferenceList diffs);

void tliInfo
 (String am, int ts, String src, int line, TriComponentId c, int level, String info)
```

9.5 Data

TCI IDL ADT	ANSI C representation (Type definition)	Notes and comments
TciModuleIdType	`QualifiedName`	

TciModuleParameterType	`typedef struct TciModuleParameterType`
	`{`
	`  String  parName;`
	`  Value defaultValue;`
	`} TciModuleParameterType;`	

TciModuleParameterListType	`typedef struct TciModuleParameterListType`
	`{`
	`  long int  length;`
	`  TciModuleParameterType *modParList;`
	`} TciModuleParameterListType;`	

TCI IDL ADT	ANSI C representation (Type definition)	Notes and comments

TciParameterType	typedef struct TciParameterType
	{
	  String parName;
	  TciParameterPassingModeType
	parPassMode;
	  Value parValue;
	} TciParameterType;	

TciParameterPassingModeType	typedef enum
	{
	  TCI_IN_PAR = 0,
	  TCI_INOUT_PAR = 1,
	  TCI_OUT_PAR = 2
	} TciParameterPassingModeType;	

TciParameterListType	typedef struct TciParameterListType
	{
	  long int length;
	  TciParameterType *parList;
	} TciParameterListType;
		length 0 shall be interpreted as "empty list".

TciParameterTypeListType	typedef struct TciParameterTypeListType
	{
	  long int length;
	  TciParameterTypeType *parList;
	} TciParameterTypeListType;
		length 0 shall be interpreted as "empty list".

TciParameterTypeType	typedef struct TciParameterTypeType {
	  Type parameterType;
	  TciParameterPassingModeType mode;
	} TciParameterTypeType;	

TciTestCaseIdListType	typedef struct TciTestCaseIdListType
	{
	  long int length;
	  QualifiedName *idList;
	} TciTestCaseIdListType;
		length 0 shall be interpreted as "empty list".

TciTypeClassType	typedef enum
	{
	  TCI_ADDRESS_TYPE,
	  TCI_ANYTYPE_TYPE,
	  TCI_BITSTRING_TYPE,
	  TCI_BOOLEAN_TYPE,
	  TCI_CHAR_TYPE,
	  TCI_CHARSTRING_TYPE,
	  TCI_COMPONENT_TYPE,
	  TCI_ENUMERATED_TYPE,
	  TCI_FLOAT_TYPE,
	  TCI_HEXSTRING_TYPE,
	  TCI_INTEGER_TYPE,
	  TCI_OCTETSTRING_TYPE,
	  TCI_RECORD_TYPE,
	  TCI_RECORD_OF_TYPE,
	  TCI_ARRAY_TYPE,
	  TCI_SET_TYPE,
	  TCI_SET_OF_TYPE,
	  TCI_UNION_TYPE,
	  TCI_UNIVERSAL_CHAR_TYPE,
	  TCI_UNIVERSAL_CHARSTRING_TYPE,
	  TCI_VERDICT_TYPE
	} TciTypeClassType;	

TciTestComponentKindType	typedef enum
	{
	  TCI_CTRL_COMP,
	  TCI_MTC_COMP,
	  TCI_PTC_COMP,
	  TCI_SYS_COMP,
	  TCI_ALIVE_COMP
	} TciTestComponentKindType;	

TciBehaviourIdType	QualifiedName	

TCI IDL ADT	ANSI C representation (Type definition)	Notes and comments
TciValueDifference	typedef struct TciValueDifference { Value val; TciValueTemplate tmpl; String desc; } TciValueDifference;	
TciValueDifferenceList	typedef struct TciValueDifferenceList { long int length; TciValueDifference* diffList; } TciValueDifferenceList;	length 0 shall be interpreted as "empty list".

9.6 Miscellaneous

TCI concept	ANSI C representation	Notes and comments
Verdict representation		
NONE	const int TCI_VERDICT_NONE = 0	Since the VerdictValue interface is defined in terms of integers, consensus must be established on which value defines which verdict.
PASS	const int TCI_VERDICT_PASS = 1	
INCONC	const int TCI_VERDICT_INCONC = 2	
FAIL	const int TCI_VERDICT_FAIL = 3	
ERROR	const int TCI_VERDICT_ERROR = 4	
CharstringValue representation		
TciCharString	typedef struct TciCharStringValue { unsigned long int length; char* string; } TciCharStringValue	
Universal Character[string] representation		
Universal Char	typedef unsigned char TciUCValue[4]	
Universal Charstring	typedef struct TciUCStringValue { unsigned long int length; TciUCValue *string; } TciUCStringValue;	

9.7 Optional parameters

Clause 7.4 defines that a reserved value shall be used to indicate the absence of an optional parameter. For the C language mapping an explicit null shall be used. The function `tciSetNull` can be used to set a value to null and `tciIsNull` can be used to check whether a value represents null. `tciIsNull` returns true if the value is null, false otherwise.

For example, if in the `tciReplyConnected` operation the value parameter shall be omitted, then a value `reply` shall be created and set to null; the operation invocation shall be:

```
tciSetNull(reply);
tciReplyConnected (sender, receiver, signature, parameterList, reply).
```

10 C++ language mapping

10.1 Introduction

This clause introduces the TCI C++ language mapping for the definitions given in clause 7.

10.2 Names and scopes

The namespace ORG_ETSI_TTCN3_TCI has been defined for the TCI C++ mapping, in order to avoid conflicts with the different names used, for example, in the C mapping.

C++ class identifiers are omitting the trailing "Type" at the end of the abstract definitions, e.g. the type TciModuleIdType is mapped to TciModuleId in C++.

10.3 Memory management

A general policy for memory management is not defined in this mapping. However, parameters are passed as pointers (or references) where possible, and a clone method has been added to the definition of every interface. The clone method can be used by the receiving entity to make a local copy where needed.

10.4 Error handling

No additional error handling has been defined for this mapping.

10.5 Type mapping

This clause introduces the TRI C++ language mapping for the abstract types defined in 7.2. The following concepts have been used:

- Pure virtual classes have been used, following the concept of an interface.
- The Standard Template Library (STL) has been used as it is a standardized way of using container classes, and iterators, such as lists. All classes define the operator "<" for easy insertion in STL containers.
- C++ types have been encapsulated under abstract definitions, like Tfloat or Tinteger.

10.5.1 Encapsulated C++ types

The following types have been defined in order to keep the definitions of data types and operations as general as possible:

Boolean type definition:	`typedef bool Tboolean`
Integer type definition:	`typedef long int Tinteger`
Size type definition:	`typedef unsigned long int Tsize`
Index type definition	`typedef unsigned long int Tindex`
Float type definition:	`typedef double Tfloat`
Char type definition:	`typedef char Tchar`
String type definition:	`typedef std::string Tstring`
Universal char type definition:	`typedef wchar_t TuniversalChar`
Universal string type definition:	`typedef std::wstring TuniversalString`
Bit type definition:	`typedef unsigned char Tbit`

10.5.2 General abstract data types

10.5.2.1 TciBehaviourId

Identifies a TTCN-3 behaviour functions. It is mapped to the following pure virtual class:

```
class TciBehaviourId: ORG_ETSI_TTCN3_TRI::QualifiedName {
public:
    virtual ~TciBehaviourId ();
    virtual Tboolean equals (const TciBehaviourId &bid) const =0;
    virtual TciBehaviourId * cloneBehaviourId () const =0;
    virtual Tboolean operator< (const TciBehaviourId &bid) const =0;
}
```

10.5.2.1.1 Methods

- ~TciBehaviourId ()
  Destructor
- equals (const TciBehaviourId &bid)
  Returns true if both objects are equal.
- cloneBehaviourId ()
  Return a copy of the TciBehaviourId.
- operator< (const TciBehaviourId &bid)
  Operator < overload.

10.5.2.2 TciModuleId

A value of TciModuleId specifies the name of a TTCN-3 module as defined in the ATS. It is mapped to the following pure virtual class:

```
class TciModuleId {
public:
    virtual ~TciModuleId ()
    virtual const Tstring & getObjectName() const = 0;
    virtual void setObjectName (const Tstring &p_name)=0;
    virtual Tboolean equals (const TciModuleId &mid) const =0;
    virtual TciModuleId * cloneModuleId () const =0;
    virtual Tboolean operator< (const TciModuleId &mid) const =0;
}
```

10.5.2.2.1 Methods

- ~TciModuleId ()
  Destructor
- getObjectName()
  Get the moduleId name
- setObjectName (const Tstring &p_name)
  Set the moduleId name
- equals (const TciModuleId &mid)
  Returns true if both objects are equal.
- cloneModuleId ()
  Return a copy of the TciModuleId.
- operator< (const TciModuleId &mid)
  Operator < overload.

10.5.2.3 TciModuleParameterId

A value of TciModuleParameterId specifies the name of a TTCN-3 module parameter as defined in the ATS. It is mapped to the following pure virtual class:

```
class TriModuleParameterId : ORG_ETSI_TTCN3_TRI::QualifiedName {
public:
    virtual ~TciModuleParameterId ();
    virtual Tboolean equals (const TciModuleParameterId &mparId) const =0;
    virtual TciModuleParameterId * cloneModuleParameterId () const =0;
    virtual Tboolean operator< (const TciModuleParameterId &mparId) const =0;
}
```

10.5.2.3.1 Methods

- ~TciModuleParameterId ()
  Destructor
- equals (const TciModuleParameterId &mparId)
  Returns true if both objects are equal.

- cloneModuleParameterId ()
  Return a copy of the TciModuleParameterId.
- operator< (const TciModuleParameterId &mparId)
  Operator < overload.

10.5.2.4 TciTestCaseId

A value of TciModuleParameterId specifies the name of a TTCN-3 testcase as defined in the ATS. It is mapped to the following pure virtual class:

```
class TriTestCaseId : TciBehaviourId {
public:
    virtual ~TciTestCaseId();
    virtual Tboolean equals (const TciTestCaseId &tcid) const =0;
    virtual TciTestCaseId * cloneTestCaseId () const =0;
    virtual Tboolean operator< (const TciTestCaseId &tcid) const =0;
}
```

10.5.2.4.1 Methods

- ~TciTestCaseId();
  Destructor
- equals (const TciTestCaseId &tcid)
  Returns true if both objects are equal.
- cloneTestCaseId ()
  Return a copy of the TciTestCaseId.
- operator< (const TciTestCaseId &tcid)
  Operator < overload.

10.5.2.5 TciModuleIdList

A value of TciModuleIdList defines a list of TciModuleId elements. It is mapped to the following pure virtual class:

```
class TciModuleIdList {
public:
    virtual ~TciModuleIdList();
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector< const TciModuleId * > & getComponents () const =0;
    virtual const TciModuleId &get (Tsize p_index) const =0;
    virtual void clear ()=0;
    virtual void add (const TciModuleId &comp)=0;
    virtual Tboolean equals (const TciModuleIdList &midList) const =0;
    virtual TciModuleIdList * cloneModuleIdList () const =0;
    virtual Tboolean operator< (const TciModuleIdList &midList) const =0;
}
```

10.5.2.5.1 Methods

- ~TciModuleIdList ()
  Destructor
- size ()
  Return the size of the list
- isEmpty ()
  Return true if the list is empty
- getComponents ()
  Return the elements of the list
- get (Tindex p_index)
  Return the requested element.
- clear ()
  Remove all the components from this list.

- add (const TciModuleId &comp)
  Add a component to the end of this list
- equals (const TciModuleIdList &midList)
  Returns true if both objects are equal.
- cloneModuleIdList ()
  Return a copy of the TciModuleId.
- operator< (const TciModuleIdList &midList)
  Operator < overload.

10.5.2.6 TciModuleParameter

This abstract type is used to represent the parameter name and the default value of a module parameter. It is mapped to the following pure virtual class:

```
class TciModuleParameter {
public:
    virtual ~TciModuleParameter ();
    virtual const TciValue & getDefaultValue () const =0;
    virtual const Tstring & getModuleParameterName () const =0;
    virtual const TciModuleParameterId & getTciModuleParameterId () const =0;
    virtual Tboolean equals (const TciModuleParameter &mpar) const =0;
    virtual TciModuleParameter * cloneModuleParameter () const =0;
    virtual Tboolean operator< (const TciModuleParameter &mpar) const =0;
}
```

10.5.2.6.1 Methods

- ~TciModuleParameter ()
  Destructor
- getDefaultValue ()
  Return default value of the parameter
- getModuleParameterName ()
  Return parameter name
- getTciModuleParameterId ()
  Get the name of the module parameter as defined in the ATS.
- equals (const TciModuleParameter &mpar)
  Returns true if both objects are equal.
- cloneModuleParameter ()
  Return a copy of the TciModuleParameter.
- operator< (const TciModuleParameter &mpar)
  Operator < overload.

10.5.2.7 TciModuleParameterList

A value of TciModuleParameterList is a list of TciModuleParameter elements. It is mapped to the following pure virtual class:

```
class TciModuleParameterList {
public:
    virtual ~TciModuleParameterList ();
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector<const TciModuleParameter *> & getComponents () const =0;
    virtual const TciModuleParameter *& get (Tindex p_index) const =0;
    virtual void clear ()=0;
    virtual void add (const TciModuleParameter &comp)=0;
    virtual Tboolean equals (const TciModuleParameterList &mparList) const =0;
    virtual TciModuleParameterList * cloneModuleParameterList () const =0;
    virtual Tboolean operator< (const TciModuleParameterList &mparList) const =0;
}
```

10.5.2.7.1 Methods

- `~TciModuleParameterList ()`
  Destructor
- `size ()`
  Return the size of the list
- `isEmpty ()`
  Return true if the list is empty
- `getComponents ()`
  Retrieve the vector of module parameters
- `get (Tindex p_index)`
  Retrieve the specified element
- `clear ()`
  Remove all components from this list.
- `add (const TciModuleParameter &comp)`
  Add a component to the end of this list
- `equals (const TciModuleParameterList &mparList)`
  Returns true if both objects are equal.
- `cloneModuleParameterList ()`
  Return a copy of the TciModuleParameterList.
- `operator< (const TciModuleParameterList &mparList)`
  Operator < overload.

10.5.2.8 TciParameterPassingMode

Defines the parameter passing mode (IN,OUT,INOUT). It is mapped to the following class:

```
class  TciParameterPassingMode {
public:
    static const TciParameterPassingMode IN;
    static const TciParameterPassingMode OUT;
    static const TciParameterPassingMode INOUT;
    ~TciParameterPassingMode();
    TciParameterPassingMode( const TciParameterPassingMode &);
    const Tboolean equals (const TciParameterPassingMode &) const;
    Tstring toString () const;
    Tinteger getParameterPassingMode() const;
}
```

10.5.2.8.1 Methods

- `~TciParameterPassingMode()`
  Destructor
- `TciParameterPassingMode( const TciParameterPassingMode &);`
  Copy constructor
- `equals (const TciParameterPassingMode &)`
  Returns true if both TciParameterPassingMode objects are equal
- `toString ()`
  Returns the sting representation of the object
- `getParameterPassingMode()`
  Returns the int value that represents the enumerated value.

10.5.2.8.2 Constants

- `TciParameterPassingMode IN`
  Enumerated value IN
- `TciParameterPassingMode OUT`
  Enumerated value OUT

- TciParameterPassingMode INOUT
  Enumerated value INOUT

10.5.2.9 TciParameter

Includes a TTCN-3 Value and a TciParameterPassingMode. It is mapped to the following pure virtual class:

```
class TciParameter {
public:
    virtual ~TciParameter ();
    virtual const TciValue & getValue () const =0;
    virtual void setValue (TciValue &value)=0;
    virtual const TciParameterPassingMode &getParameterPassingMode () const =0;
    virtual void setParameterPassingMode (const TciParameterPassingMode &mode)=0;
    virtual const Tstring & getParameterName () const =0;
    virtual void setParameterName (const Tstring &name)=0;
    virtual Tboolean equals (const TciParameter &param) const =0;
    virtual TciParameter * cloneParameter () const =0;
    virtual Tboolean operator< (const TciParameter &param) const =0;
}
```

10.5.2.9.1 Methods

- ~TciParameter ()
  Destructor
- getValue ()
  Retrieve the TTCN-3 value
- setValue (TciValue &value)
  Set the TTCN-3 value
- TciParameterPassingMode &getParameterPassingMode ()
  Return the parameter passing mode
- setParameterPassingMode (const TciParameterPassingMode &mode)
  Set the parameter passing mode
- getParameterName ()
  Return the name of the parameter
- setParameterName (const Tstring &name)
  Set the name of the parameter
- equals (const TciParameter &param)
  Returns true if both objects are equal.
- cloneParameter ()
  Return a copy of the TciParameter.
- operator< (const TciParameter &param)
  Operator < overload.

10.5.2.10 TciParameterList

Defines a list of TciParameter elements. It is mapped to the following pure virtual class:

```
class TciParameterList {
public:
    virtual ~TciParameterList ();
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector< const TciParameter * > & getComponents () const =0;
    virtual const TciParameter & get (Tindex p_index) const =0;
    virtual void clear ()=0;
    virtual void add (const TciParameter &comp)=0;
    virtual Tboolean equals (const TciParameterList &param) const =0;
    virtual TciParameterList * cloneParameterList () const =0;
    virtual Tboolean operator< (const TciParameterList &param) const =0;
}
```

10.5.2.10.1 Methods

- ~TciParameterList ()
  Destructor
- size ()
  Return the size of the list
- isEmpty ()
  Return true if the list is empty
- getComponents ()
  Return a vector with the elements of the list
- get (Tindex p_index)
  Set the specified element.
- clear ()
  Remove all the components from this list.
- add (const TciParameter &comp)
  Add a component to the end of this list
- equals (const TciParameterList &param)
  Returns true if both objects are equal.
- cloneParameterList ()
  Return a copy of the TciParameterList.
- operator< (const TciParameterList &param)
  Operator < overload.

10.5.2.11 TciParameterType

Includes a TTCN-3 Type and a TciParameterPassingMode. It is mapped to the following pure virtual class:

```
class TciParameterType {
public:
    virtual ~TciParameterType ();
    virtual const TciType & getType () const =0;
    virtual const TciParameterPassingMode & getParameterPassingMode () const =0;
    virtual Tboolean equals (const TciParameterType &parType) const =0;
    virtual TciParameterType * cloneParameterType () const =0;
    virtual Tboolean operator< (const TciParameterType &parType) const =0;
}
```

10.5.2.11.1 Methods

- ~TciParameterType ()
  Destructor
- getType ()
  Return the TTCN-3 Type
- getParameterPassingMode ()
  Get the parameter passing mode
- equals (const TciParameterType &parType)
  Returns true if both objects are equal.
- cloneParameterType ()
  Return a copy of the TciParameterType.
- operator< (const TciParameterType &parType)
  Operator < overload.

10.5.2.12 TciParameterTypeList

Specifies a list of TciParameterType elements. It is mapped to the following pure virtual class:

```
class TciParameterTypeList {
public:
    virtual ~TciParameterTypeList ();
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector< const TciParameterType * > & getComponents () const =0;
    virtual const TciParameterType & get (Tindex p_position) const =0;
    virtual void clear ()=0;
    virtual void add (const TciParameterType &comp)=0;
    virtual Tboolean equals (const TciParameterTypeList &ptypeList) const =0;
    virtual TciParameterTypeList * cloneParameterTypeList () const =0;
    virtual Tboolean operator< (const TciParameterTypeList &ptypeList) const =0;
}
```

10.5.2.12.1 Methods

- ~TciParameterTypeList ()
  Destructor
- size ()
  Return the size of the list
- isEmpty ()
  Returns true if the list is empty
- getComponents ()
  Retrieve a vector which contains the elements of the list
- get (Tindex p_position)
  Return the requested element
- clear ()
  Remove all the components from this list.
- add (const TciParameterType &comp)
  Add a component to the end of this list
- equals (const TciParameterTypeList &ptypeList)
  Returns true if both objects are equal.
- cloneParameterTypeList ()
  Return a copy of the TciParameterTypeList.
- operator< (const TciParameterTypeList &ptypeList)
  Operator < overload.

10.5.2.13 TciTestComponentKind

Represents the kind of different TTCN-3 components. It is mapped to the following class:

```
class TciTestComponentKind {
public:
    static const TciTestComponentKind SYSTEM_COMP;
    static const TciTestComponentKind PTC_COMP;
    static const TciTestComponentKind PTC_ALIVE_COMP;
    static const TciTestComponentKind MTC_COMP;
    static const TciTestComponentKind CTRL_COMP;
    virtual ~TciTestComponentKind ();
    bool equals (TciTestComponentKind &p_other) const;
    Tstring toString () const;
    Tinteger getTestComponentKind() const;
}
```

10.5.2.13.1 Methods

- ~TciTestComponentKind ()
  Destructor
- equals (TciTestComponentKind &p_other)
  Returns true if both objects are equal
- toString ()
  Returns the string representation of the object.
- getTestComponentKind()
  Return the int value of the enumerated value

10.5.2.13.2 Constants

- TciTestComponentKind SYSTEM_COMP
  Enumerated value SYSTEM_COMP
- TciTestComponentKind PTC_COMP
  Enumerated value PTC_COMP
- TciTestComponentKind PTC_ALIVE_COMP
  Enumerated value PTC_ALIVE_COMP
- TciTestComponentKind MTC_COMP
  Enumerated value MTC_COMP
- TciTestComponentKind CTRL_COMP
  Enumerated value CTRL_COMP

10.5.2.14 TciTypeClass

Defines the different type classes in TTCN-3 (i.e. boolean, float, etc.). It is mapped to the following pure virtual class:

```
class TciTypeClass {
public:
    static const TciTypeClass TCI_ADDRESS
    static const TciTypeClass TCI_ANYTYPE
    static const TciTypeClass TCI_BITSTRING
    static const TciTypeClass TCI_BOOLEAN
    static const TciTypeClass TCI_CHARSTRING
    static const TciTypeClass TCI_COMPONENT
    static const TciTypeClass TCI_ENUMERATED
    static const TciTypeClass TCI_FLOAT
    static const TciTypeClass TCI_HEXSTRING
    static const TciTypeClass TCI_INTEGER
    static const TciTypeClass TCI_OCTETSTRING
    static const TciTypeClass TCI_RECORD
    static const TciTypeClass TCI_RECORD_OF
    static const TciTypeClass TCI_ARRAY
    static const TciTypeClass TCI_SET
    static const TciTypeClass TCI_SET_OF
    static const TciTypeClass TCI_UNION
    static const TciTypeClass TCI_UNIVERSAL_CHARSTRING
    static const TciTypeClass TCI_VERDICT
    ~TciTypeClass ()
    Tboolean equals (const TciTypeClass &p_other) const
    Tstring toString () const
    Tinteger getTypeClass() const
}
```

10.5.2.14.1 Methods

- ~TciTypeClass ()
  Destructor
- equals (const TciTypeClass &p_other)
  Returns true if both objects are equal
- toString ()
  Returns the string representation of the object.

- `getTypeClass()`
  Return the int value associated to the enumerated value.

10.5.2.14.2 Constants

- `TciTypeClass TCI_ADDRESS`
  Type safe enumerated TCI_ADDRESS
- `TciTypeClass TCI_ANYTYPE`
  Type safe enumerated TCI_ANYTYPE
- `TciTypeClass TCI_BITSTRING`
  Type safe enumerated TCI_BITSTRING
- `TciTypeClass TCI_BOOLEAN`
  Type safe enumerated TCI_BOOLEAN
- `TciTypeClass TCI_CHARSTRING`
  Type safe enumerated TCI_CHARSTRING
- `TciTypeClass TCI_COMPONENT`
  Type safe enumerated TCI_COMPONENT
- `TciTypeClass TCI_ENUMERATED`
  Type safe enumerated TCI_ENUMERATED
- `TciTypeClass TCI_FLOAT`
  Type safe enumerated TCI_FLOAT
- `TciTypeClass TCI_HEXSTRING`
  Type safe enumerated TCI_HEXSTRING
- `TciTypeClass TCI_INTEGER`
  Type safe enumerated TCI_INTEGER
- `TciTypeClass TCI_OCTETSTRING`
  Type safe enumerated TCI_OCTETSTRING
- `TciTypeClass TCI_RECORD`
  Type safe enumerated TCI_RECORD
- `TciTypeClass TCI_RECORD_OF`
  Type safe enumerated TCI_RECORD_OF
- `TciTypeClass TCI_ARRAY`
  Type safe enumerated TCI_ARRAY
- `TciTypeClass TCI_SET`
  Type safe enumerated TCI_SET
- `TciTypeClass TCI_SET_OF`
  Type safe enumerated TCI_SET_OF
- `TciTypeClass TCI_UNION`
  Type safe enumerated TCI_UNION
- `TciTypeClass TCI_UNIVERSAL_CHARSTRING`
  Type safe enumerated TCI_UNIVERSAL_CHARSTRING
- `TciTypeClass TCI_VERDICT`
  Type safe enumerated TCI_VERDICT

10.5.3 Abstract TTCN-3 data types and values

10.5.3.1 TciType

A value of TciType represents one of the TTCN-3 types in a TTCN-3 module. It is mapped to the following pure virtual class:

```
class TciType {
public:
    virtual ~TciType ();
    virtual const TciModuleId & getDefiningModule () const =0;
    virtual const Tstring & getName () const =0;
    virtual const TciTypeClass & getTypeClass () const =0;
```

```
    virtual const Tstring & getTypeEncoding () const =0;
    virtual const Tstring & getTypeEncodingVariant () const =0;
    virtual TciValue * newInstance ()=0;
    virtual Tboolean equals (const TciType &typ) const =0;
    virtual TciType * cloneType () const =0;
    virtual Tboolean operator< (const TciType &typ) const =0;
}
```

10.5.3.1.1 Methods

- ~TciType ()
  Destructor
- getDefiningModule ()
  Return the defining module as defined in the TTCN-3 ATS.
- getName ()
  Return type name as defined in the ATS.
- getTypeClass ()
  Return this type class
- getTypeEncoding
  Return type encoding as defined in the ATS.
- getTypeEncodingVariant
  Return encoding variant as defined in TTCN-3
- newInstance
  Return type extension
- equals (const TciType &typ)
  Return true if the types are equals
- cloneType ()
  Return a copy of the TciType.
- operator< (const TciType &typ)
  Operator < overload.

10.5.3.2 TciValue

A value of TciValue represents TTCN-3 values for a given type. It is mapped to the following pure virtual class:

```
class TciValue {
public:
    virtual ~TciValue ();
    virtual const TciType & getType () const =0;
    virtual const Tstring & getValueEncoding () const =0;
    virtual const Tstring & getValueEncodingVariant () const =0;
    virtual Tboolean notPresent () const =0;
    virtual Tboolean equals (const TciValue &val) const =0;
    virtual TciValue * cloneValue () const =0;
    virtual Tboolean operator< (const TciValue &val) const =0;
}
```

10.5.3.2.1 Methods

- ~TciValue ()
  Destructor
- getType ()
  Returns the type of the specified value
- getValueEncoding ()
  Returns the value encoding attribute as defined in TTCN-3
- getValueEncodingVariant()
  Returns the value encoding variant attribute as defined in TTCN-3
- notPresent ()
  Returns true if the specified value is omit

- equals (const TciValue &val)
  Returns true if both objects are equal.
- cloneValue ()
  Return a copy of the TciValue.
- operator< (const TciValue &val)
  Operator < overload.

10.5.3.3 IntegerValue

TTCN-3 integer value support. It is mapped to the following pure virtual class:

```
class IntegerValue : TciValue {
public:
    virtual ~IntegerValue ();
    virtual Tinteger getInt () const =0;
    virtual void setInt (Tinteger p_value)=0;
    virtual Tboolean equals (const IntegerValue &intVal) const =0;
    virtual IntegerValue * cloneIntegerValue () const =0;
    virtual Tboolean operator< (const IntegerValue &intVal) const =0;
}
```

10.5.3.3.1 Methods

- ~IntegerValue ()
  Destructor
- getInt ()
  Return integer value
- setInt (Tinteger p_value)
  Set integer value
- equals (const IntegerValue &intVal)
  Returns true if both objects are equal.
- cloneIntegerValue ()
  Return a copy of the IntegerValue.
- operator< (const IntegerValue &intVal) const =0
  Operator < overload.

10.5.3.4 FloatValue

TTCN-3 float value support. It is mapped to the following pure virtual class:

```
class FloatValue : TciValue {
public:
    virtual ~FloatValue ();
    virtual Tfloat getFloat () const =0;
    virtual void setFloat (Tfloat p_floatValue)=0;
    virtual Tboolean equals (const FloatValue &floatVal) const =0;
    virtual FloatValue * cloneFloatValue () const =0;
    virtual Tboolean operator< (const FloatValue &floatVal) const =0;
}
```

10.5.3.4.1 Methods

- ~FloatValue ()
  Destructor
- getFloat ()
  Return the float value
- setFloat (Tfloat p_floatValue)
  Set float value
- equals (const FloatValue &floatVal)
  Returns true if both objects are equal.

- cloneFloatValue ()
  Return a copy of the FloatValue.
- operator< (const FloatValue &floatVal)
  Operator < overload.

10.5.3.5 BooleanValue

TTCN-3 boolean values support. It is mapped to the following pure virtual class:

```
class BooleanValue : TciValue {
public:
    virtual ~BooleanValue ();
    virtual Tboolean getBoolean () const =0;
    virtual void setBoolean (Tboolean p_booleanValue)=0;
    virtual Tboolean equals (const BooleanValue &booleanVal) const =0;
    virtual BooleanValue * cloneBooleanValue () const =0;
    virtual Tboolean operator< (const BooleanValue &booleanVal) const =0;
}
```

10.5.3.5.1 Methods

- ~BooleanValue ()
  Destructor
- getBoolean ()
  Return the boolean value
- setBoolean (Tboolean p_booleanValue)
  Set the variable to booleanValue
- equals (const BooleanValue &booleanVal)
  Returns true if both objects are equal.
- cloneBooleanValue ()
  Return a copy of the BooleanValue.
- operator< (const BooleanValue &booleanVal)
  Operator < overload.

10.5.3.6 CharstringValue

TTCN-3 charstring value support. . It is mapped to the following pure virtual class:

```
class CharstringValue : TciValue {
public:
    virtual ~CharstringValue ();
    virtual Tchar getChar (Tindex p_position) const =0;
    virtual Tsize getLength () const =0;
    virtual const Tstring & getString () const =0;
    virtual void setChar (Tsize p_position, Tchar p_char)=0;
    virtual void setLength (Tsize p_length)=0;
    virtual void setString (const Tstring &p_charValue)=0;
    virtual Tboolean equals (const CharstringValue &charStr) const =0;
    virtual CharstringValue * cloneCharstringValue () const =0;
    virtual Tboolean operator< (const CharstringValue &charStr) const =0;
}
```

10.5.3.6.1 Methods

- ~CharstringValue ()
  Destructor
- getChar (Tindex p_position)
  Return the char at the specified position
- getLength ()
  Return length of the string
- getString ()
  Return the value of the string

- setChar (Tsize p_position, Tchar p_char)
  Set the char at the specified position
- setLength (Tsize p_length)
  Set length of the string
- setString (const Tstring &p_charValue)
  Set the value of the string
- equals (const CharstringValue &charStr)
  Returns true if both objects are equal.
- CharstringValue * cloneCharstringValue ()
  Return a copy of the CharstringValue.
- operator< (const CharstringValue &charStr)
  Operator < overload.

10.5.3.7 UniversalCharstringValue

TTCN-3 universal charstring value support. It is mapped to the following pure virtual class:

```
class UniversalCharstringValue : TciValue {
public:
    virtual ~UniversalCharstringValue ();
    virtual TuniversalChar getChar (Tindex p_position) const =0;
    virtual Tsize getLength () const =0;
    virtual const TuniversalString & getString () const =0;
    virtual void setChar (Tindex p_position, const TuniversalChar p_ucValue)=0;
    virtual void setLength (Tsize p_length)=0;
    virtual void setString (const TuniversalString &p_ucsValue)=0;
    virtual Tboolean equals (const UniversalCharstringValue &uniCharstr) const =0;
    virtual UniversalCharstringValue * cloneUniversalCharstringValue () const =0;
    virtual Tboolean operator< (const UniversalCharstringValue &uniCharstr) const =0;
}
```

10.5.3.7.1 Methods

- ~UniversalCharstringValue ()
  Destructor
- getChar (Tindex p_position)
  Return the requested element
- getLength ()
  Return the length of the universal charstring
- TuniversalString & getString ()
  Return the textual representation of the string
- setChar (Tindex p_position, const TuniversalChar p_ucValue)
  Set the char at the specified position
- setLength (Tsize p_length)
  Set the length of the string
- setString (const TuniversalString &p_ucsValue)
  Set the value of the string
- equals (const UniversalCharstringValue &uniCharstr)
  Returns true if both objects are equal.
- cloneUniversalCharstringValue ()
  Return a copy of the UniversalCharstringValue.
- operator< (const UniversalCharstringValue &uniCharstr)
  Operator < overload.

10.5.3.8 BitstringValue

TTCN-3 bitstring value support. It is mapped to the following pure virtual class:

```
class BitstringValue : TciValue {
public:
    virtual ~BitstringValue ()
    virtual Tbit getBit (Tindex p_position) const =0
    virtual Tsize getLength () const =0
    virtual const Tstring & getString () const =0
    virtual void setBit (Tindex p_position, Tbit p_bsValue)=0
    virtual void setLength (Tindex p_new_length)=0
    virtual void setString (const Tstring &p_bsValue)=0
    virtual Tboolean equals (const BitstringValue &bitStr) const =0
    virtual BitstringValue * cloneBitstringValue () const =0
    virtual Tboolean operator< (const BitstringValue &bitStr) const =0
}
```

10.5.3.8.1 Methods

- ~BitstringValue ()
  Destructor
- getBit (Tindex p_position)
  Returns the bit at the specified position
- getLength ()
  Returns the length of the string
- getString ()
  Set the value of the string
- setBit (Tindex p_position, Tbit p_bsValue)
  Set the bit value at the specified position
- setLength (Tindex p_new_length)
  Set the length of the string
- setString (const Tstring &p_bsValue)
  Set the string value
- equals (const BitstringValue &bitStr)
  Returns true if both objects are equal.
- cloneBitstringValue ()
  Return a copy of the BitstringValue.
- operator< (const BitstringValue &bitStr)
  Operator < overload.

10.5.3.9 OctetstringValue

TTCN-3 octetstring value support. It is mapped to the following pure virtual class:

```
class OctetstringValue : TciValue {
public:
    virtual ~OctetstringValue ();
    virtual Tsize getLength () const =0;
    virtual const Tchar getOctet (Tindex p_position) const =0;
    virtual const Tstring & getString () const =0;
    virtual void setLength (Tsize p_length)=0;
    virtual void setOctet (Tindex p_position, Tchar p_ochar)=0;
    virtual void setString (const Tstring &p_osValue)=0;
    virtual Tboolean equals (const OctetstringValue &octStr) const =0;
    virtual OctetstringValue * cloneOctetstringValue () const =0;
    virtual Tboolean operator< (const OctetstringValue &octStr) const =0;
}
```

10.5.3.9.1 Methods

- ~OctetstringValue ()
  Destructor
- getLength ()
  Return the length of the string
- getOctet (Tindex p_position)
  Return the textual representation of the octetchar at the specified position
- getString ()
  Set the string value
- setLength (Tsize p_length)
  Set the length of the string
- setOctet (Tindex p_position, Tchar p_ochar)
  Set the char at specified position
- setString (const Tstring &p_osValue)
  Set the value of the string.
- equals (const OctetstringValue &octStr)
  Returns true if both objects are equal.
- cloneOctetstringValue ()
  Return a copy of the OctetstringValue.
- operator< (const OctetstringValue &octStr)
  Operator < overload.

10.5.3.10 HexstringValue

TTCN-3 hexstring value support. It is mapped to the following pure virtual class:

```
class HexstringValue : TciValue {
public:
    virtual ~HexstringValue ();
    virtual Tchar getHex (Tindex p_position) const =0;
    virtual Tsize getLength () const =0;
    virtual const Tstring & getString () const =0;
    virtual void setHex (Tindex p_position, Tchar p_hcValue)=0;
    virtual void setLength (Tsize p_length)=0;
    virtual void setString (const Tstring &p_hsValue)=0;
    virtual Tboolean equals (const HexstringValue &hexStr) const =0;
    virtual HexstringValue * cloneHexstringValue () const =0;
    virtual Tboolean operator< (const HexstringValue &hexStr) const =0;
}
```

10.5.3.10.1 Methods

- ~HexstringValue ()
  Destructor
- getHex (Tindex p_position)
  Return the element at the specified position
- getLength ()
  Return the length of the string
- getString ()
  Return the string value
- setHex (Tindex p_position, Tchar p_hcValue)
  Set the hex value at the specified position
- setLength (Tsize p_length)
  Set the length of the string
- setString (const Tstring &p_hsValue)
  Set the value of the string
- equals (const HexstringValue &hexStr)
  Returns true if both objects are equal.

- cloneHexstringValue ()
  Return a copy of the HexstringValue.
- operator< (const HexstringValue &hexStr)
  Operator < overload.

10.5.3.11 RecordValue

TTCN-3 record value support. It is mapped to the following pure virtual class:

```
class RecordValue : TciValue {
public:
    virtual ~RecordValue ();
    virtual const TciValue &getField (const Tstring &p_field_name) const =0;
    virtual void setField (const Tstring &p_field_name,const TciValue &p_new_value)=0;
    virtual const std::vector< Tstring *> & getFieldNames () const =0;
    virtual void setFieldOmitted (const Tstring &fieldName)=0;
    virtual Tboolean equals (const RecordValue &rec) const =0;
    virtual RecordValue * cloneRecordValue () const =0;
    virtual Tboolean operator< (const RecordValue &rec) const =0;
}
```

10.5.3.11.1 Methods

- ~RecordValue ()
  Destructor
- getField (const Tstring &p_field_name)
  Return a reference to the field name
- setField (const Tstring &p_field_name,const TciValue &p_new_value)
  Set the value of a field
- getFieldNames ()
  Return a list which containing the names of all the fields.
- setFieldOmitted (const Tstring &fieldName)
  Set omit in one field
- equals (const RecordValue &rec)
  Returns true if both objects are equal.
- cloneRecordValue ()
  Return a copy of the RecordValue.
- operator< (const RecordValue &rec)
  Operator < overload.

10.5.3.12 RecordOfValue

TTCN-3 record of value support. It is mapped to the following pure virtual class:

```
class RecordOfValue : TciValue {
public:
    virtual ~RecordOfValue ();
    virtual const TciValue & getField (Tindex p_position)=0;
    virtual void setField (Tindex p_position, const TciValue &p_value)=0;
    virtual void appendField (const TciValue &p_value)=0;
    virtual const TciType & getElementType () const =0;
    virtual Tsize getLength () const =0;
    virtual void setLength (Tsize p_length)=0;
    virtual Tindex getOffset() const =0;
    virtual Tboolean equals (const RecordOfValue &recOf) const =0;
    virtual RecordOfValue * cloneRecordOfValue () const =0;
    virtual Tboolean operator< (const RecordOfValue &recOf) const =0;
}
```

10.5.3.12.1 Methods

- ~RecordOfValue ()
  Destructor
- getField (Tindex p_position)
  Return the field at the specified position.
- setField (Tindex p_position, const TciValue &p_value)
  Set the value at the specified position
- appendField (const TciValue &p_value)
  Add a value at the end of the record of
- getElementType ()
  Return the type of the elements of this record of
- getLength ()
  Return the length of the object
- setLength (Tsize p_length)
  Set length of the record of
- getOffset ()
  For arrays, return the lower index bound used in the type definition of arrays. Return 0 for record of and set of.
- equals (const RecordOfValue &recOf)
  Returns true if both objects are equal.
- cloneRecordOfValue ()
  Return a copy of the RecordOfValue.
- operator< (const RecordOfValue &recOf)
  Operator < overload.

10.5.3.13 UnionValue

TTCN-3 union value support. It is mapped to the following pure virtual class:

```
class UnionValue : TciValue {
public:
    virtual ~UnionValue ()
    virtual void setVariant (const Tstring &p_variantName, const TciValue &p_value)=0;
    virtual const TciValue & getVariant (const Tstring &p_variantName) const =0;
    virtual const Tstring & getPresentVariantName () const =0;
    virtual const std::set< Tstring *> & getVariantNames () const =0;
    virtual Tboolean equals (const UnionValue &unionVal) const =0;
    virtual UnionValue * cloneUnionValue () const =0;
    virtual Tboolean operator< (const UnionValue &unionVal) const =0;
}
```

10.5.3.13.1 Methods

- ~UnionValue ()
  Destructor
- setVariant (const Tstring &p_variantName, const TciValue &p_value)
  Set the variant name to a value
- getVariant (const Tstring &p_variantName)
  Return the value of the variant if exits
- getPresentVariantName ()
  Return the name of the current variant value. null if no initialized.
- getVariantNames ()
  Return a list which contains the variant names as defined in the ATS.
- equals (const UnionValue &unionVal)
  Returns true if both objects are equal.
- cloneUnionValue ()
  Return a copy of the UnionValue.

- operator< (const UnionValue &unionVal)
  Operator < overload.

10.5.3.14 EnumeratedValue

TTCN-3 enumerated value support. It is mapped to the following pure virtual class:

```
class EnumeratedValue : TciValue {
public:
    virtual ~EnumeratedValue ();
    virtual const Tstring & getEnum () const =0;
    virtual void setEnum (const Tstring &p_value)=0;
    virtual Tboolean equals (const EnumeratedValue &enumVal) const =0;
    virtual EnumeratedValue * cloneEnumeratedValue () const =0;
    virtual Tboolean operator< (const EnumeratedValue &enumVal) const =0;
}
```

10.5.3.14.1 Methods

- ~EnumeratedValue ()
  Destructor
- getEnum ()
  Return current value
- setEnum (const Tstring &p_value)
  Set the enumeration value
- equals (const EnumeratedValue &enumVal)
  Returns true if both objects are equal.
- cloneEnumeratedValue ()
  Return a copy of the EnumeratedValue.
- operator< (const EnumeratedValue &enumVal)
  Operator < overload.

10.5.3.15 VerdictValue

TTCN-3 verdict value support. It is mapped to the following pure virtual class:

```
class VerdictValue : TciValue {
public:
    virtual ~VerdictValue ();
    virtual const VerdictValueEnum & getVerdict () const =0;
    virtual void setVerdict (const VerdictValueEnum & p_enum)=0;
    virtual Tboolean equals (const VerdictValue &verdictVal) const =0;
    virtual VerdictValue * cloneVerdictValue () const =0;
    virtual Tboolean operator< (const VerdictValue &verdictVal) const =0;
}
```

10.5.3.15.1 Methods

- ~VerdictValue ()
  Destructor
- VerdictValueEnum & getVerdict ()
  Return the value of the verdict
- setVerdict (const VerdictValueEnum & p_enum)
  Set the value of the verdict.
- equals (const VerdictValue &verdictVal)
  Returns true if both objects are equal.
- cloneVerdictValue ()
  Return a copy of the VerdictValue.
- operator< (const VerdictValue &verdictVal)
  Operator < overload.

10.5.3.16 VerdictValueEnum

Enumeration of verdict values. It is mapped to the following class:

```
class VerdictValueEnum {
public:
    static const VerdictValueEnum PASS;
    static const VerdictValueEnum FAIL;
    static const VerdictValueEnum ERROR;
    static const VerdictValueEnum INCONC;
    ~VerdictValueEnum ();
    VerdictValueEnum ( const VerdictValueEnum &p_other);
    Tstring toString () const;
    Tinteger getVerdictValueEnum() const;
    Tboolean equals (const VerdictValueEnum &p_other) const;
}
```

10.5.3.16.1 Methods

- `~VerdictValueEnum ()`
  Destructor
- `VerdictValueEnum ( const VerdictValueEnum &p_other);`
  Copy constructor.
- `toString ()`
  Return string representation
- `getVerdictValueEnum()`
  Return the int value associated to the enumerated value.
- `equals (const VerdictValueEnum &p_other)`
  Return true if objects are equal.

10.5.3.16.2 Constants

- `VerdictValueEnum PASS`
  Verdict value PASS
- `VerdictValueEnum FAIL`
  Verdict value FAIL
- `VerdictValueEnum ERROR`
  Verdict value ERROR
- `VerdictValueEnum INCONC`
  Verdict value INCONC

10.5.3.17 AddressValue

TTCN-3 address value support. This implementation is platform-dependent. The AddressValue class contains a typename template Taddress. It is mapped to the following pure virtual class:

```
template <typename TAddress>;
class AddressValue {
public:
    virtual ~AddressValue ();
    virtual const TAddress& getAddress () const =0;
    virtual void setAddress ( const TAddress& T)=0;
    virtual Tboolean equals (const AddressValue &addr) const =0;
    virtual AddressValue * cloneAddressValue () const =0;
    virtual Tboolean operator< (const AddressValue &addr) const =0;
}
```

10.5.3.17.1 Methods

- `~AddressValue ()`
  Destructor
- `getAddress ()`
  Return the value of the address

- setAddress (const TAddress& T)
  Set the value of the address
- equals (const AddressValue &addr)
  Returns true if both objects are equal.
- cloneAddressValue ()
  Return a copy of the AddressValue.
- operator< (const AddressValue &addr)
  Operator < overload.

10.5.4 Abstract logging types

10.5.4.1 TciValueTemplate

Interface that defines the concrete operations of the TTCN-3 template. It is mapped to the following pure virtual class:

```
class TciValueTemplate {
public:
    virtual ~TciValueTemplate ();
    virtual Tboolean isOmit () const =0;
    virtual Tboolean isAny () const =0;
    virtual Tboolean isAnyOrOmit () const =0;
    virtual const Tstring & getTemplateDef () const =0;
    virtual Tboolean equals (const TciValueTemplate &vtempl) const =0;
    virtual TciValueTemplate * cloneValueTemplate () const =0;
    virtual Tboolean operator< (const TciValueTemplate &vtempl) const =0;
}
```

10.5.4.1.1 Methods

- ~TciValueTemplate ()
  Destructor
- isOmit ()
  Return true if value of template is omit
- isAny ()
  Return true if value of template is any
- isAnyOrOmit ()
  Return true value of template if any or omit
- getTemplateDef ()
  Return the template definition as defined in the ATS
- equals (const TciValueTemplate &vtempl)
  Returns true if both objects are equal.
- cloneValueTemplate ()
  Return a copy of the TciValueTemplate.
- operator< (const TciValueTemplate &vtempl)
  Operator < overload.

10.5.4.2 TciNonValueTemplate

Support *all* and *any* matching mechanisms over TTCN-3 components and timers. It is mapped to the following pure virtual class:

```
class TciNonValueTemplate {
public:
    virtual ~TciNonValueTemplate ();
    virtual Tboolean isAny () const =0;
    virtual Tboolean isAll () const =0;
    virtual const Tstring & getTemplateDef () const =0;
    virtual Tboolean equals (const TciNonValueTemplate &nvtempl) const =0;
    virtual TciNonValueTemplate * cloneNonValueTemplate () const =0;
    virtual Tboolean operator< (const TciNonValueTemplate &nvtempl) const =0;
}
```

10.5.4.2.1 Methods

- ~TciNonValueTemplate ()
  Destructor
- isAny ()
  Return true if value is any
- isAll ()
  Return true if is value all.
- getTemplateDef ()
  Return template definition as defined in the ATS.
- equals (const TciNonValueTemplate &nvtempl)
  Returns true if both objects are equal.
- cloneNonValueTemplate ()
  Return a copy of the TciNonValueTemplate.
- operator< (const TciNonValueTemplate &nvtempl)
  Operator < overload.

10.5.4.3 TciValueList

A list of TciValues. It is mapped to the following pure virtual class:

```
class TciValueList {
public:
    virtual ~TciValueList (void);
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector< const TciValue * > & getComponents () const =0;
    virtual const TciValue & get (Tindex index) const =0;
    virtual void clear ()=0;
    virtual void add (const TciValue &comp)=0;
    virtual Tboolean equals (const TciValueList &valList) const =0;
    virtual TciValueList * cloneValueList () const =0;
    virtual Tboolean operator< (const TciValueList &valList) const =0;
}
```

10.5.4.3.1 Methods

- ~TciValueList ()
  Destructor
- size ()
  Return the size of the list
- isEmpty ()
  Return true if the list is empty
- getComponents ()
  Return a vector which contains the values.
- get (Tindex index)
  Return the value at the specified position
- clear ()
  Remove all the elements from this list.
- add (const TciValue &comp)
  Add an element to the end of this list
- equals (const TciValueList &valList)
  Returns true if both objects are equal.
- cloneValueList ()
  Return a copy of the TciValueList.
- operator< (const TciValueList &valList)
  Operator < overload.

10.5.4.4 TciValueDifference

Represents the differences during a match operation. It is mapped to the following pure virtual class:

```
class TciValueDifference {
public:
    virtual ~TciValueDifference ();
    virtual const TciValue & getValue () const =0;
    virtual void setValue (TciValue &val)=0;
    virtual const TciValueTemplate & getTciValueTemplate () const =0;
    virtual void setTciValueTemplate (TciValueTemplate &valT)=0;
    virtual const Tstring & getDescription () const =0;
    virtual void setDescription (const Tstring &descr)=0;
    virtual Tboolean equals (const TciValueDifference &vdiff) const =0;
    virtual TciValueDifference * cloneValueDifference () const =0;
    virtual Tboolean operator< (const TciValueDifference &vdiff) const =0;
}
```

10.5.4.4.1 Methods

- ~TciValueDifference ()
  Destructor
- getValue ()
  Return the value definition
- setValue (TciValue &val)
  Set the value definition
- getTciValueTemplate ()
  Return the template definition
- setTciValueTemplate (TciValueTemplate &valT)
  Set the template definition
- getDescription ()
  Return a string which describes the difference.
- setDescription (const Tstring &descr)
  Set description
- equals (const TciValueDifference &vdiff)
  Returns true if both objects are equal.
- cloneValueDifference ()
  Return a copy of the TciValueDifference.
- operator< (const TciValueDifference &vdiff)
  Operator < overload.

10.5.4.5 TciValueDifferenceList

Collection of TciValueDifferences. It is mapped to the following pure virtual class:

```
class TciValueDifferenceList {
public:
    virtual ~TciValueDifferenceList ();
    virtual Tsize size () const =0;
    virtual Tboolean isEmpty () const =0;
    virtual const std::vector< TciValueDifference * > & getComponents () const =0;
    virtual const TciValueDifference & get (Tinteger p_position) const =0;
    virtual void clear ()=0;
    virtual void add (const TciValueDifference &comp)=0;
    virtual Tboolean equals (const TciValueDifferenceList &vdList) const =0;
    virtual TciValueDifferenceList * cloneValueDifferenceList () const =0;
    virtual Tboolean operator< (const TciValueDifferenceList &vdList) const =0;
}
```

10.5.4.5.1 Methods

- ~TciValueDifferenceList ()
  Destructor
- size ()
  Return the size of the list
- isEmpty ()
  Return true if this list contains no elements.
- getComponents ()
  Return a vector with the elements.
- get (Tinteger p_position)
  Return the requested difference.
- clear ()
  Remove all the components from this list.
- add (const TciValueDifference &comp)
  Add a component to the end of the list
- equals (const TciValueDifferenceList &vdList)
  Returns true if both objects are equal.
- cloneValueDifferenceList ()
  Return a copy of the TciValueDifferenceList.
- operator< (const TciValueDifferenceList &vdList)
  Operator < overload.

10.5.4.6 ComponentStatus

Type-safe enumeration implementation of ComponentStatus. A value of type ComponentStatus is either inactiveC, runningC, stoppedC or killedC. This value represents the status of a component. It is mapped to the following class:

```
class ComponentStatus {
public:
    static const ComponentStatus INNACTIVE_C;
    static const ComponentStatus RUNNING_C;
    static const ComponentStatus STOPPED_C;
    static const ComponentStatus KILLED_C;
    virtual ~ComponentStatus ();
    ComponentStatus (const ComponentStatus &);
    Tstring toString () const;
    Tboolean equals (const ComponentStatus &cmps) const;
    Tinteger getComponentStatus () const;
}
```

10.5.4.6.1 Methods

- ~ComponentStatus ()
  Destructor.
- ComponentStatus (const ComponentStatus &)
  Copy constructor.
- toString ()
  Returns the status as string value.
- equals (const ComponentStatus &cmps)
  Returns true if objects are equal.
- getComponentStatus ()
  Returns the status value.

10.5.4.6.2 Constants

- ComponentStatus INNACTIVE_C
  Indicates the inactive status of a component
- ComponentStatus RUNNING_C
  Indicates the running state of a component

- `ComponentStatus STOPPED_C`
  Indicates the stopped status of a component.
- `ComponentStatus KILLED_C`
  Indicates the killed status of a component.

10.5.4.7 TimerStatus

Type-safe enumeration implementation of TimerStatus. A value of type TimerStatus is either runningT, inactiveT, expiredT. This value represents the status of a timer. It is mapped to the following class:

```
class TimerStatus {
public:
    static const TimerStatus RUNNING_T;
    static const TimerStatus INACTIVE_T;
    static const TimerStatus EXPIRED_T;
    virtual ~TimerStatus ();
    TimerStatus (const TimerStatus &);
    Tstring toString () const;
    Tboolean equals (const TimerStatus &status) const;
    Tinteger getTimerStatus () const;
}
```

10.5.4.7.1 Methods

- `~TimerStatus ()`
  Destructor.
- `TimerStatus (const TimerStatus &)`
  Copy constructor.
- `toString ()`
  Returns the status as string value.
- `equals (const TimerStatus &status)`
  Returns true if objects are equal.
- `getTimerStatus ()`
  Returns the status value.

10.5.4.7.2 Constants

- `TimerStatus RUNNING_T`
  Indicates the inactive status of a component
- `TimerStatus INACTIVE_T`
  Indicates the running state of a component
- `TimerStatus EXPIRED_T`
  Indicates the stopped status of a component.

10.5.4.8 TciStatus

Type-safe enumeration implementation of TciStatus. A value of type TciStatus is either TCI_OK or TCI_ERROR. This value represents the success or failure of a TCI operation. It is mapped to the following class:

```
class TciStatus {
public:
    static const TciStatus TCI_OK;
    static const TciStatus TCI_ERROR;
    virtual ~TciStatus ();
    TciStatus (const TciStatus &);
    Tstring toString () const;
    Tboolean equals (const TciStatus &status) const;
    Tinteger getStatus () const;
}
```

10.5.4.8.1 Methods

- ~TciStatus ()
  Destructor.
- TciStatus (const TciStatus &)
  Copy constructor.
- toString ()
  Returns the status as string value.
- equals (const TciStatus &status)
  Returns true if objects are equal.
- getStatus ()
  Returns the status value.

10.5.4.8.2 Constants

- TciStatus TCI_OK
  Indicates the success of an operation.
- TciStatus TCI_ERROR
  Indicates the failure of an operation.

10.6 Operations mapping

10.6.1 TCI-TM

10.6.1.1 TciTmRequired

Specifies the operations the TM requires from TE. It is mapped to the following interface:

```
//Destructor
virtual ~TciTmRequired ();

//Selects the indicated module for execution
virtual void tciRootModule (const TciModuleId *moduleName)=0;

//The TE provides to the management a list of imported modules of the root module
virtual const TciModuleIdList * getImportedModules () const =0;

//The TE provides to the management a list of module parameters of the identified module
virtual const TciModuleParameterList * tciGetModuleParameters (const TciModuleId
  *moduleName)=0;

//The TE provides to the management a list of test cases
virtual const TciTestCaseIdList * tciGetTestCases () const =0;

//The TE provides to the management a list of parameter types of the given test case
virtual const TciParameterTypeList * tciGetTestCaseParameters (const TciTestCaseId
  *testCaseId) const =0;

//The TE provides to the management a list of system ports of the given test case
virtual const TriPortIdList * tciGetTestCaseTSI (const TciTestCaseId &testCaseId) const =0;

//Starts a testcase in the currently selected module with the given parameters
virtual void tciStartTestCase (const TciTestCaseId *testCaseId, const TciParameterList
  *parameterList)=0;

//Stops the testcase currently being executed
virtual void tciStopTestCase ()=0;

//Starts the control part of the selected module
virtual const TriComponentId * tciStartControl ()=0;
```

```
•
• //Stops execution of the control part
• virtual void tciStopControl ()=0;
```

10.6.1.2 TciTmProvided

Specifies the operation the TM has to provide to the TE. It is mapped to the following interface:

```
• //Destructor
• virtual ~TciTmProvided ()
•
• //Indicates to the TM that a test case with testCaseId has been started
• virtual void tciTestCaseStarted (const TciTestCaseId &testCaseId, const TciParameterList
    &parameterList, const Tfloat &timer)=0;
•
• //Called to indicate that the test case has terminated execution
• virtual void tciTestCaseTerminated (const VerdictValue &verdict, const TciParameterList
    &parameterList)=0;
•
• //Called to indicate that the control part of the selected module has just terminated
    execution
• virtual void tciControlTerminated ()=0;
•
• //The management provides to the TE a Value for the indicated parameterId
• virtual TciValue * tciGetModulePar (const TciModuleParameterId &parameterId)=0;
•
• //Indicates the occurrence of an unrecoverable error situation
• virtual void tciError (const Tstring &message)=0;
•
• //The TE indicates a message of a test component
• virtual void tciLog (const TriComponentId &testComponentId, const Tstring &message)=0;
```

10.6.2 TCI-CD

10.6.2.1 TciCdRequired

This class defines the TCI_CD required interface. It is mapped to the following interface:

```
• //Destructor
• virtual ~TciCdRequired ();
•
• //Returns a type representing a ttcn type
• virtual const TciType * getTypeForName (const Tstring typeName) const =0;
•
• //Constructs and returns a basic TTCN-3 integer type
• virtual const TciType & getInteger () const =0;
•
• //Constructs and returns a basic TTCN-3 float type
• virtual const TciType & getFloat () const =0;
•
• //Constructs and returns a basic TTCN-3 boolean type
• virtual const TciType & getBoolean () const =0
•
• //Constructs and returns a basic TTCN-3 charstring type
• virtual const TciType & getCharstring () const =0
•
• //Constructs and returns a basic TTCN-3 universal charstring type
• virtual const TciType & getUniversalCharstring () const =0
•
• //Constructs and returns a basic TTCN-3 hexstring type
• virtual const TciType & getHexstring () const =0
•
• //Constructs and returns a basic TTCN-3 bitstring type
• virtual const TciType & getBitstring () const =0
•
```

```
//Constructs and returns a basic TTCN-3 octetstring type
virtual const TciType & getOctetstring () const =0

//Constructs and returns a basic TTCN-3 verdict type
virtual const TciType & getVerdict () const =0

//The TE will be notified about an unrecoverable error situation within the CD
virtual void tciErrorReq (const Tstring message)=0
```

10.6.2.2 TciCdProvided

This class defines the TCI_CD provided interface. It is mapped to the following interface:

```
//Destructor
virtual ~TciCdProvided ()

//This operation is called whenever the TE has to decode and encode value
virtual TciValue * decode (const TriMessage *p_message, const TciType *p_decodingHypothesis)=0

//This operation is called whenever the TE has to encode a Value
virtual TriMessage * encode (const TciValue *p_value)=0
```

10.6.3 TCI-CH

10.6.3.1 TciChRequired

This class defines the TCI_CH required interface. It is mapped to the following interface:

```
//Default destructor
virtual ~TciChRequired ()

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciSendConnected has been called
virtual void tciEnqueueMsgConnected (const TriPortId *sender, const TriComponentId *receiver,
  const TciValue *rcvdMessage)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciCallConnected has been called
virtual void tciEnqueueCallConnected (const TriPortId *sender, const TriComponentId *receiver,
  const TriSignatureId *signature, const TciParameterList *parameterList)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciReplyConnected has been called
virtual void tciEnqueueReplyConnected (const TriPortId *sender, const TriComponentId
  *receiver, const TriSignatureId *signature, const TciParameterList *parameterList, const
  TciValue *returnValue)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciRaiseConnected has been called
virtual void tciEnqueueRaiseConnected (const TriPortId *sender, const TriComponentId
  *receiver, const TriSignatureId *signature, const TciValue *exception)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciCreateTestComponentReq has been called
virtual const TriComponentId * tciCreateTestComponent (const TciTestComponentKind *kind, const
  TciType *componentType, const Tstring *name)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciStartTestComponentReq has been called
virtual void tciStartTestComponent (const TriComponentId *component, const TciBehaviourId
  *behaviour, const TciParameterList *parameterList)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciStopTestComponentReq has been called
virtual void tciStopTestComponent (const TriComponentId *component)=0
```

```
//This operation is called by the CH at the local TE when at a remote TE a provided tciConnect
  //has been called
virtual void tciConnect (const TriPortId *fromPort, const TriPortId *toPort)

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciDisconnect has been called
virtual void tciDisconnect (const TriPortId *fromPort, const TriPortId *toPort)=0

//This operation is called by the CH at the local TE when at a remote TE a provided tciMapReq
  //has been called
virtual void tciMap (const TriPortId *fromPort, const TriPortId *toPort)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  tciUnmapReq //has been called
virtual void tciUnmap (const TriPortId *fromPort, const TriPortId *toPort)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  tciUnmapReq //has been called
virtual void tciTestComponentTerminated (const TriComponentId *component, const VerdictValue
  *verdict) const =0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciTestComponentRunningReq has been called
virtual Tboolean tciTestComponentRunning (const TriComponentId *component) const =0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciTestComponentDoneReq has been called
virtual Tboolean tciTestComponentDone (const TriComponentId *comp) const =0

//This operation can be called by the CH at the appropriate local TE when at a remote TE a
  //provided tciGetMTCReq has been called
virtual const TriComponentId * tciGetMTC () const =0

//This operation is called by the CH at the appropriate local TE when at a remote TE a
  provided //tciExecuteTestCaseReq has been called
virtual void tciExecuteTestCase (const TciTestCaseId *testCaseId, const TriPortIdList
  *tsiPortList)=0

//This operation is called by the CH at appropriate local TEs when at a remote TE a provided
  //tciResetReq has been called
virtual void tciReset ()=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciKillTestComponentReq has been called
virtual void tciKillTestComponent (const TriComponentId *comp)=0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciTestComponentAliveReq has been called
virtual Tboolean tciTestComponentAlive (const TriComponentId *comp) const =0

//This operation is called by the CH at the local TE when at a remote TE a provided
  //tciTestComponentKilledReq has been called
virtual Tboolean tciTestComponentKilled (const TriComponentId *comp) const =0
```

10.6.3.2 TciChProvided

This class defines the TCI_CH provided interface. . It is mapped to the following interface:

```
//Destructor
virtual ~TciChProvided ()

//Called by the TE when it executes a TTCN-3 unicast send operation on a component port
virtual void tciSendConnected (const TriPortId *sender, const TriComponentId *receiver, const
  TciValue *sendMessage)=0

//Called by the TE when it executes a TTCN-3 broadcast send operation on a component port
virtual void tciSendConnectedBC (const TriPortId *sender, const TciValue *sendMessage)=0

//Called by the TE when it executes a TTCN-3 multicast send operation on a component port
```

- virtual void tciSendConnectedMC (const TriPortId *sender, const TriComponentIdList *receivers, const TciValue *sendMessage)=0
-
- //Called by the TE when it executes a TTCN-3 unicast call operation on a component port
- virtual void tciCallConnected (const TriPortId *sender, const TriComponentId *receiver, const TriSignatureId *signature, const TciParameterList *parameterList)=0
-
- //Called by the TE when it executes a TTCN-3 broadcast call operation on a component port
- virtual void tciCallConnectedBC (const TriPortId *sender, const TriSignatureId *signature, const TciParameterList *parameterList)=0
-
- //Called by the TE when it executes a TTCN-3 multicast call operation on a component port
- virtual void tciCallConnectedMC (const TriPortId *sender, const TriComponentIdList *receivers, const TriSignatureId *signature, const TciParameterList *parameterList)=0
-
- //Called by the TE when it executes a TTCN-3 unicast reply operation on a component port
- virtual void tciReplyConnected (const TriPortId *sender, const TriComponentId *receiver, const TriSignatureId *signature, const TciParameterList *parameterList, const TciValue *returnValue)=0
-
- //Called by the TE when it executes a TTCN-3 broadcast reply operation on a component port
- virtual void tciReplyConnectedBC (const TriPortId *sender, const TriSignatureId *signature, const TciParameterList *parameterList, const TciValue *returnValue)=0
-
- //Called by the TE when it executes a TTCN-3 multicast reply operation on a component
- virtual void tciReplyConnectedMC (const TriPortId *sender, const TriComponentIdList *receivers, const TriSignatureId *signature, const TciParameterList *parameterList, const TciValue *returnValue)=0
-
- //Called by the TE when it executes a TTCN-3 unicast raise operation on a component port
- virtual void tciRaiseConnected (const TriPortId *sender, const TriComponentId *receiver, const TriSignatureId *signature, const TciValue *exception)=0
-
- //Called by the TE when it executes a TTCN-3 broadcast raise operation on a component portvirtual void tciRaiseConnectedBC (const TriPortId *sender, const TriSignatureId *signature, const TciValue *exception)=0
-
- //Called by the TE when it executes a TTCN-3 multicast raise operation on a component
- virtual void tciRaiseConnectedMC (const TriPortId *sender, const TriComponentIdList *receiver, const TriSignatureId *signature, const TciValue *exception)=0
-
- //Called from the TE when a component has to be created
- virtual const TriComponentId * tciCreateTestComponentReq (const TciTestComponentKind *kind, const QualifiedName *componentType, const Tstring &name)=0
-
- //Called by the TE when it executes the TTCN-3 start operation
- virtual void tciStartTestComponentReq (const TriComponentId *component, const TciBehaviourId *behaviour, const TciParameterList *parameterList)=0
-
- //Called by the TE when it executes the TTCN-3 stop operation
- virtual void tciStopTestComponentReq (const TriComponentId *component)=0
-
- //Called by the TE when it executes a TTCN-3 connect operation
- virtual void tciConnectReq (const TriPortId *fromPort, const TriPortId *toPort)=0
-
- //Called by the TE when it executes a TTCN-3 disconnect operation
- virtual void tciDisconnectReq (const TriPortId *fromPort, const TriPortId *toPort)=0
-
- //Called by the TE when it executes a TTCN-3 map operation
- virtual void tciMapReq (const TriPortId *fromPort, const TriPortId *toPort)=0
-
- //Called by the TE when it executes a TTCN-3 unmap operation
- virtual void tciUnmapReq (const TriPortId *fromPort, const TriPortId *toPort)=0
-
- //Called by the TE when a test component terminates execution
- virtual void tciTestComponentTerminatedReq (const TriComponentId *component, const VerdictValue *verdict)=0
-
- //Called by the TE when it executes a TTCN-3 running operation
- virtual Tboolean tciTestComponentRunningReq (const TriComponentId *component) const =0

```
//Called by the TE when it executes a TTCN-3 done operation
virtual Tboolean tciTestComponentDoneReq (const TriComponentId *comp) const =0

//Called by the TE when it executes a TTCN-3 mtc operation
virtual const TriComponentId * tciGetMTCReq () const =0

//Called by the TE immediately before it starts the test case behaviour on the MTC
virtual void tciExecuteTestCaseReq (const TciTestCaseId *testCaseId, const TriPortIdList
  *tsiPortList)=0

//Called by the TE at any time to reset the test system
virtual void tciResetReq ()=0

//Called by the TE when it executes the TTCN-3 kill operation
virtual void tciKillTestComponentReq (const TriComponentId *comp)=0

//Called by the TE when it executes the TTCN-3 alive operation
virtual Tboolean tciTestComponentAliveReq (const TriComponentId *comp) const =0

//Called by the TE when it executes the TTCN-3 killed operation
virtual Tboolean tciTestComponentKilledReq (const TriComponentId *comp) const =0
```

10.6.4 TCI-TL

10.6.4.1 TciTlProvided

This class defines the TCI_TL provided Tinterface.

```
//Default constructor
TciTlProvided ()

// Destructor
virtual ~TciTlProvided ()

//Called by TE to log the execute test case request
virtual void tliTcExecute (const Tstring &am, const timeval ts, const Tstring src, const
  Tinteger line, const TriComponentId *c, const TciTestCaseId *tcId, const TriParameterList
  *triPars, const TriTimerDuration *dur)=0

//Called by TE to log the start of a testcase. This event occurs before the testcase is
  started
virtual void tliTcStart (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const TciTestCaseId *tcId, const TciParameterList
  *tciPars, const TriTimerDuration *dur)=0

//Called by TE to log the stop of a testcase
virtual void tliTcStop (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c)=0

//Called by TE to log the start of a testcase
virtual void tliTcStarted (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const TciTestCaseId *tcId, const TciParameterList
  *tciPars, const TriTimerDuration *dur)=0

//Called by TE to log the termination of a testcase
virtual void tliTcTerminated (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const TciTestCaseId *tcId, const TciParameterList
  *tciPars, const VerdictValue *verdict)=0

//Called by TE to log the start of the control part
virtual void tliCtrlStart (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c)=0

//Called by TE to log the stop of the control part. This event occurs after the control has
  //stopped. If the control is not represented by TRI component, c is null
virtual void tliCtrlStop (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c)=0
```

```
•
• //Called by TE to log the termination of the control part
• virtual void tliCtrlTerminated (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log a unicast send operation
• virtual void tliMSend_m (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TciValue *msgValue, const TriAddress *address, const TciStatus *encoderFailure, const
    TriMessage *msg, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast send operation
• virtual void tliMSend_m_BC (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TciValue *msgValue, const TciStatus *encoderFailure, const TriMessage *msg, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log a multicast send operation
• virtual void tliMSend_m_MC (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TciValue *msgValue, const TriAddressList *addresses, const TciStatus *encoderFailure, const
    TriMessage *msg, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a unicast send operation
• virtual void tliMSend_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TciValue *msgValue, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast send operation
• virtual void tliMSend_c_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TciValue *msgValue, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a multicast send operation
• virtual void tliMSend_c_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TciValue *msgValue, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log the enqueuing of a message
• virtual void tliMDetected_m (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from, const
    TriMessage *msg, const TriAddress *address)=0
•
• //Called by CH to log the enqueuing of a message
• virtual void tliMDetected_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from, const
    TciValue *msgValue)=0
•
• //Called by TE to log the mismatch of a template
• virtual void tliMMismatch_m (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TciValue *msgValue, const
    TciValueTemplate *msgTmpl, const TciValueDifferenceList *diffs, const TriAddress *address,
    const TciValueTemplate *addressTmpl)=0
•
• //Called by TE to log the mismatch of a template
• virtual void tliMMismatch_c (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TciValue *msgValue, const
    TciValueTemplate *msgTmpl, const TciValueDifferenceList *diffs, const TriComponentId *from,
    const TciNonValueTemplate *fromTmpl)=0
•
• // Called by TE to log the receiving of a message
• virtual void tliMRecieve_m (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TciValue *msgValue, const
    TciValueTemplate *msgTmpl, const TriAddress *address, const TciValueTemplate *addressTmpl)=0
•
• //Called by TE to log the mismatch of a template
• virtual void tliMReceive_c (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TciValue *msgValue, const
    TciValueTemplate *msgTmpl, const TriComponentId *fromComp, const TciNonValueTemplate
    *fromTmpl)=0
```

```
•
• //Called by TE to log a unicast call operation
• virtual void tliPrCall_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TriAddress *address, const
    TciStatus *encoderFailure, const TriParameterList *triPars, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log a broadcast call operation
• virtual void tliPrCall_m_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciStatus *encoderFailure,
    const TriParameterList *triPars, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a multicast call operation
• virtual void tliPrCall_m_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TriAddressList *addresses,
    const TciStatus *encoderFailure, const TriParameterList *triPars, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log a unicast call operation
• virtual void tliPrCall_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log a broadcast call operation
• virtual void tliPrCall_c_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortIdList *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log a multicast call operation
• virtual void tliPrCall_c_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TriStatus
    *transmissionFailure)=0
•
• //Called by TE to log the getcall enqueue operation
• virtual void tliPrGetCallDetected_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TriParameterList *triPars, const TriAddress
    *address)=0
•
• //Called by TE to log the getcall enqueue operation
• virtual void tliPrGetCallDetected_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TciParameterList *tciPars)=0
•
• //Called by TE to log the mismatch of a getcall
• virtual void tliPrGetCallMismatch_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValueDifferenceList *diffs, const TriAddress *address, const TciValueTemplate
    *addressTmpl)=0
•
• //Called by TE to log the mismatch of a getcall
• virtual void tliPrGetCallMismatch_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValueDifferenceList *diffs, const TriComponentId *from, const TciValueTemplate
    *fromTmpl)=0
•
• //Called by TE to log getting a call
• virtual void tliPrGetCall_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TriAddress *address, const TciValueTemplate *addressTmpl)=0
```

```
•
• //Called by TE to log getting a call
• virtual void tliPrGetCall_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TriComponentId *from, const TciNonValueTemplate *fromTmpl)=0
•
• //Called by TE to log a unicast reply operation
• virtual void tliPrReply_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *replValue, const
    TriAddress *address, const TciStatus *encoderFailure, const TriParameterList *triPars, const
    TriParameter *repl, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast reply operation
• virtual void tliPrReply_m_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *replValue, const
    TciStatus *encoderFailure, const TriParameterList *triPars, const TriParameter *repl, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log a multicast reply operation
• virtual void tliPrReply_m_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *replValue, const
    TriAddressList *addresses, const TciStatus *encoderFailure, const TriParameterList *triPars,
    const TriParameter *repl, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a unicast reply operation
• virtual void tliPrReply_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciValue *parsValue, const TciValue *replValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast reply operation
• virtual void tliPrReply_c_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TriSignatureId *signature, const TciValue *parsValue, const TciValue *replValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log og a multicast reply operation
• virtual void tliPrReply_c_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TriSignatureId *signature, const TciValue *parsValue, const TciValue *replValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log the getreply enqueue operation
• virtual void tliPrGetReplyDetected_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TriParameterList *triPars, const TriParameter *repl,
    const TriAddress *address)=0
•
• //Called by CH to log the getreply enqueue operation
• virtual void tliPrGetReplyDetected_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TciParameterList *tciPars, const TciValue
    *replValue)=0
•
• //Called by TE to log the mismatch of a getreply operation
• virtual void tliPrGetReplyMismatch_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValue *replValue, const TciValueTemplate *replyTmpl, const TciValueDifferenceList *diffs,
    const TriAddress *address, const TciValueTemplate *addressTmpl)=0
•
• //Called by TE to log the mismatch of a getreply operation
• virtual void tliPrGetReplyMismatch_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValue *replValue, const TciValueTemplate *replyTmpl, const TciValueDifferenceList *diffs,
    const TriComponentId *from, const TciNonValueTemplate *fromTmpl)=0
```

```
•
• //Called by TE to log getting a reply
• virtual void tliPrGetReply_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValue *replValue, const TciValueTemplate *replyTmpl, const TriAddress *address, const
    TciValueTemplate *addressTmpl)=0
•
• //Called by TE to log getting a reply
• virtual void tliPrGetReply_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciParameterList *tciPars, const TciValueTemplate *parsTmpl, const
    TciValue *replValue, const TciValueTemplate *replyTmpl, const TriComponentId *from, const
    TciNonValueTemplate *fromTmpl)=0
•
• //Called by TE to log a unicast raise operation
• virtual void tliPrRaise_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriAddress *address, const TriStatus *encoderFailure, const TriException *exc, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast raise operation
• virtual void tliPrRaise_m_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriStatus *encoderFailure, const TriException *exc, const TriStatus *transmissionFailure)=0
•
• //Called by TE to log a multicast raise operation
• virtual void tliPrRaise_m_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriAddressList *addresses, const TriStatus *encoderFailure, const TriException *exc, const
    TriStatus *transmissionFailure)=0
• //Called by TE to log a unicast raise operation
• virtual void tliPrRaise_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log a broadcast raise operation
• virtual void tliPrRaise_c_BC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log a multicast raise operation
• virtual void tliPrRaise_c_MC (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortIdList *to, const
    TriSignatureId *signature, const TciParameterList *tciPars, const TciValue *excValue, const
    TriStatus *transmissionFailure)=0
•
• //Called by TE to log the catch enqueue operation
• virtual void tliPrCatchDetected_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TriException *exc, const TriAddress *address)=0
•
• //Called by TE to log the catch enqueue operation
• virtual void tliPrCatchDetected_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriPortId *from,
    const TriSignatureId *signature, const TciValue *excValue)=0
•
• //Called by TE to log the mismatch of a catch operation
• virtual void tliPrCatchMismatch_m (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciValue *excValue, const TciValueTemplate *excTmpl, const
    TciValueDifferenceList *diffs, const TriAddress *address, const TciValueTemplate
    *addressTmpl)=0
```

```
•
• //Called by TE to log the mismatch of a catch operation
• virtual void tliPrCatchMismatch_c (const Tstring &am, const timeval ts, const Tstring src,
    const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciValue *excValue, const TciValueTemplate *excTmpl, const
    TciValueDifferenceList *diffs, const TriComponentId *from, const TciNonValueTemplate
    *fromTmpl)=0
•
• //Called by TE to log catching an exception
• virtual void tliPrCatch_m (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciValue *excValue, const TciValueTemplate *excTmpl, const TriAddress
    *address, const TciValueTemplate *addressTmpl)=0
•
• //Called by TE to log catching an exception
• virtual void tliPrCatch_c (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature, const TciValue *excValue, const TciValueTemplate *excTmpl, const TriComponentId
    *from, const TciNonValueTemplate *fromTmpl)=0
•
• //Called by TE to log the detection of a catch timeout
• virtual void tliPrCatchTimeoutDetected (const Tstring &am, const timeval ts, const Tstring
    src, const Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature)=0
•
• //Called by TE to log catching a timeout
• virtual void tliPrCatchTimeout (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *at, const TriSignatureId
    *signature)=0
•
• //Called by TE to log the create component operation
• virtual void tliCCreate (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriComponentId *comp, const Tstring &name,
    const Tboolean alive)=0
•
• //Called by TE to log the start component operation
• virtual void tliCStart (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriComponentId *comp, const TciBehaviourId
    *beh, const TciParameterList *tciPars)=0
•
• //Called by TE to log the running component operation
• virtual void tliCRunning (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriComponentId *comp, const ComponentStatus
    status)=0
•
• //Called by TE to log the alive component operation
• virtual void tliCAlive (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriComponentId *comp, const ComponentStatus
    status)=0
•
• //Called by TE to log the stop component operation
• virtual void tliCStop (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriComponentId *comp)=0
•
• //Called by TE to log the kill component operation
• virtual void tliCKill (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriComponentId *comp)=0
•
• //Called by TE to log the mismatch of a done component operation
• virtual void tliCDoneMismatch (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriComponentId *comp, const
    TciNonValueTemplate *compTmpl)=0
•
• //Called by TE to log the done component operation
• virtual void tliCDone (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TciNonValueTemplate *compTmpl)=0
•
• //Called by TE to log the mismatch of a killed component operation
• virtual void tliCKilledMismatch (const Tstring &am, const timeval ts, const Tstring &src,
    const Tinteger line, const TriComponentId *c, const TciNonValueTemplate *compTmpl)=0
```

```
•
• //Called by TE to log the killed component operation
• virtual void tliCKilled (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TciNonValueTemplate *compTmpl)=0
•
• //Called by TE to log the termination of a component
• virtual void tliCTerminated (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const VerdictValue *verdict)=0
•
• //Called by TE to log the connect operation
• virtual void tliPConnect (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *port1, const TriPortId *port2)=0
•
• //Called by TE to log the connect operation
• virtual void tliPDisconnect (const Tstring &am, const timeval ts, const Tstring src, const
    Tinteger line, const TriComponentId *c, const TriPortId *port1, const TriPortId *port2)=0
•
• //Called by TE to log the map operation
• virtual void tliPMap (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriPortId *port1, const TriPortId *port2)=0
•
• //Called by TE to log the unmap operation
• virtual void tliPUnmap (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *port1, const TriPortId *port2)=0
•
• //Called by TE to log the port clear operation
• virtual void tliPClear (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *port)=0
•
• //Called by TE to log the port start operation
• virtual void tliPStart (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriPortId *port)=0
•
• //Called by TE to log the port stop operation
• virtual void tliPStop (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriPortId *port)=0
•
• //Called by TE to log the port stop operation
• virtual void tliPHalt (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriPortId *port)=0
•
• //Called by TE to log the encode operation
• virtual void tliEncode (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TciValue *val, const TciStatus
    *encoderFailure, const TriMessage *msg, const Tstring &codec)=0
•
• //Called by TE to log the decode operation
• virtual void tliDecode (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriMessage *msg, const TciStatus
    *decoderFailure, const TciValue *val, const Tstring &codec)=0
•
• //Called by TE to log the detection of a timeout
• virtual void tliTTimeoutDetected (const Tstring &am, const timeval ts, const Tstring &src,
    const Tinteger line, const TriComponentId *c, const TriTimerId *timer)=0
•
• //Called by TE to log a timeout mismatch
• virtual void tliTTimeoutMismatch (const Tstring &am, const timeval ts, const Tstring &src,
    const Tinteger line, const TriComponentId *c, const TriTimerId *timer, const
    TciNonValueTemplate *timerTmpl)=0
•
• //Called by TE to log a timeout match
• virtual void tliTTimeout (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriTimerId *timer, const TciNonValueTemplate
    *timerTmpl)=0
•
• //Called by TE to log the start of a timer
• virtual void tliTStart (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriTimerId *timer, const TriTimerDuration
    *dur)=0
```

```
•
• //Called by TE to log the stop of a timer
• virtual void tliTStop (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriTimerId *timer, const TriTimerDuration *dur)=0
•
• //Called by TE to log the reading of a timer
• virtual void tliTRead (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const TriTimerId *timer, const TriTimerDuration *elapsed)=0
•
• //Called by TE to log the running timer operation
• virtual void tliTRunning (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const TriTimerId *timer, const TimerStatus status)=0
•
• //Called by TE to log the entering of a scope
• virtual void tliSEnter (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const QualifiedName &name, const TciParameterList
    *tciPars, const Tstring &kind)=0
•
• //Called by TE to log the leaving of a scope
• virtual void tliSLeave (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const QualifiedName &name, const TciParameterList
    *tciPars, const TciValue *returnValue, const Tstring &kind)=0
•
• //Called by TE to log the modification of the value of a variable
• virtual void tliVar (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const QualifiedName &name, const TciValue *varValue)=0
•
• //Called by TE to log the value of a module parameter
• virtual void tliModulePar (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const QualifiedName &name, const TciValue
    *parValue)=0
•
• //Called by TE to log the value of a module parameter
• virtual void tliGetVerdict (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const VerdictValue *verdict)=0
•
• //Called by TE to log the setverdict operation
• virtual void tliSetVerdict (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const VerdictValue *verdict, const TString
    &reason)=0
•
• //Called by TE to log the TTCN-3 statement log
• virtual void tliLog (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
    line, const TriComponentId *c, const Tstring *log)=0
•
• //Called by TE to log entering an alt
• virtual void tliAEnter (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log leaving an alt
• virtual void tliALeave (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log the nomatch of an alt
• virtual void tliANomatch (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log repeating an alt
• virtual void tliARepeat (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log entering the default section
• virtual void tliADefaults (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c)=0
•
• //Called by TE to log the activation of a default
• virtual void tliAActivate (const Tstring &am, const timeval ts, const Tstring &src, const
    Tinteger line, const TriComponentId *c, const QualifiedName &name, const TciParameterList
    *tciPars, const TciValue *ref)=0
```

```
//Called by TE to log the deactivation of a default
virtual void tliADeactivate (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const TciValue *ref)=0

//Called by TE to log entering an alt
virtual void tliAWait (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
  line, const TriComponentId *c)=0

//Called by TE to log that the component executed an SUT action
virtual void tliAction (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const Tstring &action)=0

//Called by TE to log that the component successfully executed a match operation
virtual void tliMatch (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
  line, const TriComponentId *c, const TciValue &expr, const TciValueTemplate &tmpl)=0

//Called by TE to log that the component executed a match operation, and a mismatch occurred
virtual void tliMatchMismatch (const Tstring &am, const timeval ts, const Tstring &src, const
  Tinteger line, const TriComponentId *c, const TciValue &expr, const TciValueTemplate &tmpl,
  const TciValueDifferenceList &diffs)=0

//Can be called by the TE to log additional information during test execution
virtual void tliInfo (const Tstring &am, const timeval ts, const Tstring &src, const Tinteger
  line, const TriComponentId *c, const Tinteger level, const Tstring &info)=0
```

11 W3C XML mapping

11.1 Introduction

This clause introduces the TCI XML mapping [6], [7] and [8] for the logging interface of TCI. The XML mapping for the logging interface defines how the IDL definitions for TCI-TL described in clause 7 are mapped to XML. The complete schema definitions for this mapping are given in annex B.

11.2 Scopes

The IDL module **`tciInterface`** is mapped to an XML schema with the name space `http://uri.etsi.org/ttcn-3/tci/TLI_v3_3_1.xsd`

This schema uses further schemas:

- `http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd`
  for the mapping of simple types to XML.
- `http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd`
  for the mapping of structured types to XML.
- `http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd`
  for the mapping of values to XML.
- `http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd`
  for the mapping of templates to XML.
- `http://uri.etsi.org/ttcn-3/tci/Events_v3_3_1.xsd`
  for the mapping of logging events to XML.

11.3 Type mapping

11.3.1 Mapping of simple types

11.3.1.1 TBoolean

The IDL **`TBoolean`** type is mapped to the xsd basic type `boolean`.

11.3.1.2 TString

The IDL **`TString`** type is mapped to the xsd basic type `string`.

11.3.1.3 TInteger

The IDL **`TInteger`** type is mapped to the xsd basic type `integer`.

11.3.1.4 TriTimerDurationType

The IDL **`TriTimerDurationType`** type is mapped to the xsd basic type `float`.

11.3.1.5 TciParameterPassingModeType

The IDL **`TciParameterPassingModeType`** type is mapped to the xsd basic type `string` with enumeration values `'in'`, `'out'` and `'inout'`.

11.3.1.6 TriStatusType

The IDL **`TriStatusType`** type is mapped to the xsd basic type `string` with enumeration values `'TRI_Ok'` and `'TRI_Error'`.

11.3.1.7 TciStatusType

The IDL **`TriStatusType`** type is mapped to the xsd basic type `string` with enumeration values `'TCI_Ok'` and `'TCI_Error'`.

11.3.1.8 ComponentStatusType

The IDL **`ComponentStatusType`** type is mapped to the xsd basic type `string` with enumeration values `'inactiveC'`, `'runningC'`, `'stoppedC'` and `'killedC'`.

11.3.1.9 TimerStatusType

The IDL **`TimerStatusType`** type is mapped to the xsd basic type `string` with enumeration values `'runningT'`, `'inactiveT'` and `'expiredT'`.

11.3.1.10 PortStatusType

The IDL **`PortStatusType`** type is mapped to the xsd basic type `string` with enumeration values `'startedP'`, `'haltedP'` and `'stoppedP'`.

11.3.2 Complex type mapping

11.3.2.1 TriPortIdType

`TriPortIdType` is mapped to the following complex type:

```
<xsd:complexType name="TriPortIdType">
    <xsd:sequence>
        <xsd:element name="comp" type="Types:TriComponentIdType" />
        <xsd:element name="port" type="Types:Port"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `comp` The TRI component identifier.
- `port` The identification of the port.

Attributes:

- none.

11.3.2.2 TriComponentIdType

`TriComponentIdType` is mapped to the following complex type:

```
<xsd:compleporxType name="TriComponentIdType">
    <xsd:sequence>
        <xsd:choice>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="id" type="Types:Id"/>
        </xsd:choice>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `id` The identifier of the TRI component.
- `null` The `null` identifier. To be used if there is no TRI component identifier.

Attributes:

- none.

11.3.2.3 TriComponentIdListType

`TriComponentIdListType` is mapped to the following complex type:

```
<xsd:complexType name="TriComponentIdListType">
    <xsd:sequence>
        <xsd:element name="comp" type="Types:TriComponentIdType" minOccurs="0"
         maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `comp` The identifiers of TRI components in that list.

Attributes:

- none.

11.3.2.4 Port

`Port` is mapped to the following complex type:

```
<xsd:complexType name="Port">
    <xsd:sequence>
        <xsd:element name="id" type="Types:Id"/>
        <xsd:element name="index" type="xsd:int"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `id` The port identifier.
- `port` The port index.

Attributes:

- none.

11.3.2.5 Id

`Id` is used as identification for components, ports and timers and is mapped to the following complex type:

```
<xsd:complexType name="Id">
    <xsd:sequence>
        <xsd:element name="name" type="SimpleTypes:TString"/>
        <xsd:element name="id" type="SimpleTypes:TString" minOccurs="0"/>
        <xsd:element name="type" type="SimpleTypes:TString" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `name` The name of the component, port or timer.
- `id` The internal representation of the component, port or timer.
- `type` The type of the component, port or timer.

Attributes:

- none.

11.3.2.6 TriMessageType

`TriMessageType` is mapped to the following complex type:

```
<xsd:complexType name="TriMessageType">
    <xsd:attribute name="val" type="xsd:hexBinary"/>
</xsd:complexType>
```

Elements:

- `val` The encoded message.

Attributes:

- none.

11.3.2.7 TriParameterType

`TriParameterType` is mapped to the following complex type:

```
<xsd:complexType name="TriParameterType">
    <xsd:sequence>
        <xsd:element name="val" type="xsd:hexBinary"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="SimpleTypes:TString"/>
    <xsd:attribute name="mode" type="SimpleTypes:TciParameterPassingModeType"/>
</xsd:complexType>
```

Elements:

- `val` The encoded parameter.

Attributes:

- `name` The parameter name.
- `mode` The parameter passing mode.

11.3.2.8 TriParameterListType

`TriParameterListType` is mapped to the following complex type:

```
<xsd:complexType name="TriParameterListType">
    <xsd:sequence>
        <xsd:element name="par" type="Types:TriParameterType" minOccurs="0"
        maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
```

Sequence of Elements:

- `par` The parameters in that list.

Attributes:

- none.

11.3.2.9 TriAddressType

`TriAddressType` is mapped to the following complex type:

```
<xsd:complexType name="TriAddressType">
    <xsd:attribute name="val" type="SimpleTypes:TString"/>
</xsd:complexType>
```

Elements:

- `val` The address value.

Attributes:

- none.

11.3.2.10 TriAddressListType

`TriAddressListType` is mapped to the following complex type:

```
<xsd:complexType name="TriAddressListType">
    <xsd:sequence>
        <xsd:element name="addr" type="Types:TriAddressType" minOccurs="0"
         maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `addr` The addresses in that list.

Attributes:

- none.

11.3.2.11 TriExceptionType

`TriExceptionType` is mapped to the following complex type:

```
<xsd:complexType name="TriExceptionType">
    <xsd:attribute name="val" type="SimpleTypes:TString"/>
</xsd:complexType>
```

Elements:

- `val` The exception.

Attributes:

- none.

11.3.2.12 TriSignatureIdType

`TriSignatureIdType` is mapped to the following complex type:

```
<xsd:complexType name="TriSignatureIdType">
    <xsd:attribute name="val" type="SimpleTypes:TString" use="required"/>
</xsd:complexType>
```

Elements:

- `val` The signature.

Attributes:

- none.

11.3.2.13 TriTimerIdType

`TriTimerIdType` is mapped to the following complex type:

```
<xsd:complexType name="TriTimerIdType">
    <xsd:sequence>
        <xsd:element name="id" type="Types:Id"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `id` The identification of the timer.

Attributes:

- none.

11.3.2.14 TriTimerDurationType

`TriTimerDurationType` is mapped to the following simple type:

```
<xsd:simpleType name="TriTimerDurationType">
    <xsd:restriction base="xsd:float"/>
</xsd:simpleType>
```

11.3.2.15 QualifiedName

`QualifiedName` is used to fully qualify module parameters, variables, etc and is mapped to the following complex type:

```
<xsd:complexType name="QualifiedName">
    <xsd:attribute name="moduleName" type="SimpleTypes:TString" use="required"/>
    <xsd:attribute name="baseName" type="SimpleTypes:TString" use="required"/>
</xsd:complexType>
```

Elements:

- `moduleName` The module name of the TTCN-3 module.
- `baseName` The name of the object that is fully qualified.

Attributes:

- none.

11.3.2.16 TciBehaviourIdType

`TciBehaviourIdType` is mapped to the following complex type:

```
<xsd:complexType name="TciBehaviourIdType">
    <xsd:sequence>
        <xsd:element name="name" type="Types:QualifiedName"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `name` The qualified name of the behaviour.

Attributes:

- none.

11.3.2.17 TciTestCaseIdType

`TciTestCaseIdType` is mapped to the following complex type:

```
<xsd:complexType name="TciTestCaseIdType">
    <xsd:sequence>
        <xsd:element name="name" type="Types:QualifiedName"/>
    </xsd:sequence>
</xsd:complexType>
```

Elements:

- `name` The qualified name of the test case.

Attributes:

- none.

11.3.2.18 TciParameterType

`TciParameterType` is mapped to the following complex type:

```
<xsd:complexType name="TciParameterType">
    <xsd:sequence>
        <xsd:element name="val" type="Values:Value"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="SimpleTypes:TString"/>
    <xsd:attribute name="mode" type="SimpleTypes:TciParameterPassingModeType"/>
</xsd:complexType>
```

Elements:

- `val` The encoded parameter.

Attributes:

- `name` The parameter name.
- `mode` The parameter passing mode.

11.3.2.19 TciParameterListType

`TciParameterListType` is mapped to the following complex type:

```
<xsd:complexType name="TciParameterListType">
    <xsd:sequence>
        <xsd:element name="par" type="Types:TciParameterType"
         minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
```

Sequence of Elements:

- `par` The parameters in that list.

Attributes:

- none.

11.3.3 Abstract value mapping

11.3.3.1 Value

`Value` is mapped to the following complex type:

```
<xsd:complexType name="Value" mixed="true">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue"/>
        <xsd:element name="float" type="Values:FloatValue"/>
        <xsd:element name="boolean" type="Values:BooleanValue"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"/>
        <xsd:element name="charstring" type="Values:CharstringValue"/>
        <xsd:element name="universal_charstring" type="Values:UniversalCharstringValue"/>
        <xsd:element name="record" type="Values:RecordValue"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"/>
        <xsd:element name="array" type="Values:ArrayValue"/>
        <xsd:element name="set" type="Values:SetValue"/>
        <xsd:element name="set_of" type="Values:SetOfValue"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
        <xsd:element name="union" type="Values:UnionValue"/>
        <xsd:element name="anytype" type="Values:AnytypeValue"/>
        <xsd:element name="address" type="Values:AddressValue"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:attributeGroup name="ValueAtts">
    <xsd:attribute name="name" type="SimpleTypes:TString" use="optional"/>
    <xsd:attribute name="type" type="SimpleTypes:TString" use="optional"/>
    <xsd:attribute name="module" type="SimpleTypes:TString" use="optional"/>
    <xsd:attribute name="annotation" type="SimpleTypes:TString" use="optional"/>
</xsd:attributeGroup>
```

Choice of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.

Attributes:

- `name` The name of the value, if known.
- `type` The type of the value, if known.
- `module` The module of the value, if known.
- `annotation` A helper attribute to provide additional matching/mismatching information, etc.

11.3.3.2 IntegerValue

`IntegerValue` is mapped to the following complex type:

```
<xsd:complexType name="IntegerValue">
    <xsd:choice >
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Simple Content:

- `value` The integer value as string.
- `null` If no value is given.

- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.3 FloatValue

`FloatValue` is mapped to the following complex type:

```
<xsd:complexType name="FloatValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
                <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The float value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.4 BooleanValue

`BooleanValue` is mapped to the following complex type:

```
<xsd:complexType name="BooleanValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
                <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The boolean value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.5 Void

11.3.3.6 VerdictValue

`VerdictValue` is mapped to the following complex type:

```
<xsd:complexType name="VerdictValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
                <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The verdict value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.7 BitstringValue

`BitstringValue` is mapped to the following complex type:

```
<xsd:complexType name="BitstringValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
            <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The bitstring value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.8 HexstringValue

`HexstringValue` is mapped to the following complex type:

```
<xsd:complexType name="HexstringValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
            <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The hexstring value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.9 OctetstringValue

`OctetstringValue` is mapped to the following complex type:

```
<xsd:complexType name="OctetstringValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
            <xsd:attributeGroup ref="Values:ValueAtts"/>
```

```
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The octetstring value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.10 CharstringValue

`CharstringValue` is mapped to the following complex type:

```
<xsd:complexType name="CharstringValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
            <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The charstring value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.11 UniversalCharstringValue

`UniversalCharstringValue` is mapped to the following complex type:

```
<xsd:complexType name="UniversalCharstringValue">
    <xsd:simpleContent>
        <xsd:extension base="SimpleTypes:TString">
            <xsd:attributeGroup ref="Values:ValueAtts"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
```

Simple Content:

- `value` The universal charstring value as string.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.12 RecordValue

`RecordValue` is mapped to the following complex type:

```
<xsd:complexType name="RecordValue">
    <xsd:choice>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:CharstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
        </xsd:choice>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd: choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Sequence of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.

- `null` If no field is given.
- `omit` If the field is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.13 RecordOfValue

`RecordOfValue` is mapped to the following complex type:

```
<xsd:complexType name="RecordOfValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="charstring" type="Values:CharstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="array" type="Values:ArrayValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="set" type="Values:SetValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="set_of" type="Values:SetOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Choice of Sequence of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.

- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.
- `null` If no field is given.
- `omit` If the field is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.14 ArrayValue

`ArrayValue` is mapped to the following complex type:

```
<xsd:complexType name="ArrayValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="charstring" type="Values:CharstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="array" type="Values:ArrayValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="set" type="Values:SetValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="set_of" type="Values:SetOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"
                minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
                maxOccurs="unbounded"/>
```

```
            <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
```

Choice of Sequence of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.
- `null` If no field is given.
- `omit` If the field is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.15 SetValue

`SetValue` is mapped to the following complex type:

```
    <xsd:complexType name="SetValue">
        <xsd:choice>
            <xsd:choice minOccurs="0" maxOccurs="unbounded">
                <xsd:element name="integer" type="Values:IntegerValue"/>
                <xsd:element name="float" type="Values:FloatValue"/>
                <xsd:element name="boolean" type="Values:BooleanValue"/>
                <xsd:element name="verdicttype" type="Values:VerdictValue"/>
                <xsd:element name="bitstring" type="Values:BitstringValue"/>
                <xsd:element name="hexstring" type="Values:HexstringValue"/>
                <xsd:element name="octetstring" type="Values:OctetstringValue"/>
                <xsd:element name="charstring" type="Values:CharstringValue"/>
```

```
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
        </xsd:choice>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Sequence of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.
- `null` If no field is given.
- `omit` If the field is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.16 SetOfValue

`SetOfValue` is mapped to the following complex type:

```
<xsd:complexType name="SetOfValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="charstring" type="Values:CharstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="universal_charstring"
            type="Values:UniversalCharstringValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="array" type="Values:ArrayValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="set" type="Values:SetValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="set_of" type="Values:SetOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>        </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Choice of Sequence of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.

- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.
- `null` If no field is given.
- `omit` If the field is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.17 EnumeratedValue

`EnumeratedValue` is mapped to the following complex type:

```
<xsd:complexType name="EnumeratedValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    </xsd:sequence>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

Sequence of Elements:

- `value` The enumeration value.
- `null` If no value is given.
- `omit` If the value is omitted.

Attributes:

- The same attributes as those of Value.

11.3.3.18 UnionValue

`UnionValue` is mapped to the following complex type:

```
<xsd:complexType name="UnionValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue"/>
        <xsd:element name="float" type="Values:FloatValue"/>
        <xsd:element name="boolean" type="Values:BooleanValue"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"/>
        <xsd:element name="charstring" type="Values:CharstringValue"/>
        <xsd:element name="universal_charstring"
            type="Values:UniversalCharstringValue"/>
        <xsd:element name="record" type="Values:RecordValue"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"/>
        <xsd:element name="array" type="Values:ArrayValue"/>
        <xsd:element name="set" type="Values:SetValue"/>
        <xsd:element name="set_of" type="Values:SetOfValue"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
        <xsd:element name="union" type="Values:UnionValue"/>
```

```
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
```

Choice of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.
- `address` An address value.

Attributes:

- The same attributes as those of Value.

11.3.3.19 AnytypeValue

`AnytypeValue` is mapped to the following complex type:

```
    <xsd:complexType name="AnytypeValue">
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:OctetstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
```

```
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
```

Choice of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `address` An address value.

Attributes:

- The same attributes as those of Value.

11.3.3.20 AddressValue

`AddressValue` is mapped to the following complex type:

```
    <xsd:complexType name="AddressValue">
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:OctetstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
```

```
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
```

Choice of Elements:

- `integer` An integer value.
- `float` A float value.
- `boolean` A boolean value.
- `verdicttype` A verdicttype value.
- `bitstring` A bitstring value.
- `hexstring` A hexstring value.
- `octetstring` An octetstring value.
- `charstring` A charstring value.
- `universal_charstring` A universal charstring value.
- `record` A record value.
- `record_of` A record of value.
- `array` An array of value.
- `set` A set value.
- `set_of` A set of value.
- `enumerated` An enumerated value.
- `union` A union value.
- `anytype` An anytype value.

Attributes:

- The same attributes as those of Value.

11.3.4 Abstract logging types mapping

Additional types are defined to ease the logging of matches between values and templates.

11.3.4.1 TciValueTemplate

`TciValueTemplate` is mapped to the following complex type:

```
    <xsd:complexType name="TciValueTemplate">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Values:Value">
            <xsd:choice minOccurs="0">
                <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                <xsd:element name="float" type="Templates:FloatTemplate"/>
                <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
                <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
```

```
            <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
            <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
            <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
            <xsd:element name="universal_charstring"
             type="Templates:UniversalCharstringTemplate"/>
            <xsd:element name="record" type="Templates:RecordTemplate"/>
            <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
            <xsd:element name="array" type="Templates:ArrayTemplate"/>
            <xsd:element name="set" type="Templates:SetTemplate"/>
            <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
            <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
            <xsd:element name="union" type="Templates:UnionTemplate"/>
            <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
            <xsd:element name="address" type="Templates:AddressTemplate"/>
            <xsd:element name="omit" type="Templates:omit"/>
            <xsd:element name="any" type="Templates:any"/>
            <xsd:element name="anyoromit" type="Templates:anyoromit"/>
            <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        </xsd:choice>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
```

Choice of Elements:

- `integer` An integer template.
- `float` A float template.
- `boolean` A boolean template.
- `verdicttype` A verdicttype template.
- `bitstring` A bitstring template.
- `hexstring` A hexstring template.
- `octetstring` An octetstring template.
- `charstring` A charstring template.
- `universal_charstring` A universal charstring template.
- `record` A record template.
- `record_of` A record of template.
- `array` An array template.
- `set` A set template.
- `set_of` A set of template.
- `enumerated` An enumerated template.
- `union` A union template.
- `anytype` An anytype template.
- `address` An address template.
- `omit` An omit template.
- `any` An any template.
- `anyoromit` An anyoromit template.
- `templateDef` A complex template definition.

Attributes:

- none.

11.3.4.2 TciNonValueTemplate

`TciNonValueTemplate` is mapped to the following complex type:

```
    <xsd:complexType name="TciNonValueTemplate">
        <xsd:sequence>
            <xsd:choice>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="all" type="Templates:all"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                <xsd:element name="null" type="Templates:null"/>
            </xsd:choice>
        </xsd:sequence>
    </xsd:complexType>
```

Choice of Elements:

- `any` An any template.
- `all` An all template.
- `templateDef` A complex template definition.
- `null` No template is given.

Attributes:

- none.

11.3.4.3 TciValueList

`TciValueList` is mapped to the following complex type:

```
    <xsd:complexType name="TciValueList">
        <xsd:sequence>
            <xsd:element name="val" type="Values:Value"
             maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
```

Sequence of Elements:

- `val` The values in the value list.

Attributes:

- none.

11.3.4.4 TciValueDifference

`TciValueDifference` is mapped to the following complex type:

```
    <xsd:complexType name="TciValueDifference">
            <xsd:sequence>
                  <xsd:element name="val" type="SimpleTypes:xpath"/>
                  <xsd:element name="tmpl"
type="SimpleTypes:xpath"/>
            </xsd:sequence>
              <xsd:attributeGroup ref="Values:ValueAtts"/>
            <xsd:attribute name="desc" type="SimpleTypes:TString"
    use="optional"/>
        </xsd:complexType>
```

Sequence of Elements:

- `val` A reference to the mismatching value.
- `tmpl` A reference to the template.

Attributes:

- The same attributes as those of Value.
- `desc` The reason of the mismatch.

11.3.4.5 TciValueDifferenceList

`TciValueDifferenceList` is mapped to the following complex type:

```
<xsd:complexType name="TciValueDifferenceList">
    <xsd:sequence>
        <xsd:element name="diff" type="Templates:TciValueDifference"
         maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
```

Sequence of Elements:

- `diff` The value/template differences in the value difference list.

Attributes:

- none.

11.4 Mapping of the operations on the logging interface

Every operation provided at the logging interface has a corresponding complex type definition in XML. These complex type definitions are extensions of Event.

11.4.1 Event

`Event` is mapped to the following complex type:

```
<!-- common definition for all events -->
<xsd:complexType name="Event" mixed="true">
    <xsd:sequence>
        <xsd:element name="am" type="SimpleTypes:TString"/>
    </xsd:sequence>
    <xsd:attribute name="ts" type="xsd:long" use="required"/>
    <xsd:attribute name="src" type="SimpleTypes:TString" use="optional"/>
    <xsd:attribute name="line" type="SimpleTypes:TInteger" use="optional"/>

<!-- general identifier structure for test components, ports and timer -->
    <xsd:attribute name="name" type="SimpleTypes:TString" use="required"/>
    <xsd:attribute name="id" type="SimpleTypes:TString " use="required"/>
    <xsd:attribute name="type" type="SimpleTypes:TString" use="required"/>
</xsd:complexType>
```

Elements:

- `am` A message, to be used for further information in the log.

Attributes:

- `ts` The time when the event is produced.
- `src` The source file of the test specification.
- `line` The line number where the request is performed.

- `name` The name of the component which produces this event.
- `id` The id of the component which produces this event.
- `type` The type of the component which produces this event.

11.4.2 The TCI-TL interface

11.4.2.1 TCI-TL provided

The `TCI-TL Provided` interface is mapped to the following interface:

```
<!-- testcases -->
<xsd:complexType name="tliTcExecute">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTcStart">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTcStop">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTcStarted">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTcTerminated">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="verdict" type="Values:VerdictValue"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- control -->
<xsd:complexType name="tliCtrlStart">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>
```

```
    <xsd:complexType name="tliCtrlStop">
        <xsd:complexContent>
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliCtrlTerminated">
        <xsd:complexContent>
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- asynchronous communication -->
    <xsd:complexType name="tliMSend_m">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="addrValue " type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_m_BC">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_m_MC">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
```

```
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Types:TriMessageType"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"/>
                        <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
```

```
                        <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"/>
                        <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                        <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                        <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMReceive_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                        <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMReceive_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                        <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                        <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

     <!-- synchronous communication -->
    <xsd:complexType name="tliPrCall_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
```

```
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_m_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_m_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
```

```
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="triPars" type="Types:TriParameterListType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
```

```
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCall_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCall_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
                                 type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_m_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
```

```
                                type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_m_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
                                 type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
```

```
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="triPars" type="Types:TriParameterListType" minOccurs="0"/>
                    <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReply_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
```

```
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReply_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_m_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
```

```
    <xsd:complexType name="tliPrRaise_m_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
```

```
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
```

```
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchTimeoutDetected">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchTimeout">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- components -->
    <xsd:complexType name="tliCCreate">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="comp" type="Types:TriComponentIdType"/>
                    <xsd:element name="name" type="SimpleTypes:TString"/>
                    <xsd:element name="alive" type="SimpleTypes:TBoolean"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliCStart">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="comp" type="Types:TriComponentIdType"/>
                    <xsd:element name="name" type="Types:TciBehaviourIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliCRunning">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="comp" type="Types:TriComponentIdType"/>
                    <xsd:element name="status" type="SimpleTypes:ComponentStatusType"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>


    <xsd:complexType name="tliCAlive">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="comp" type="Types:TriComponentIdType"/>
                    <xsd:element name="status" type="SimpleTypes:ComponentStatusType"/>
                </xsd:sequence>
```

```
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCStop">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCKill">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCDoneMismatch">
   <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCKilledMismatch">
   <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCDone">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

 <xsd:complexType name="tliCKilled">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCTerminated">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue" />
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- ports -->
<xsd:complexType name="tliPConnect">
```

```
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortConfiguration"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPDisconnect">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortConfiguration"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPMap">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortConfiguration"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPUnmap">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortConfiguration"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPClear">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPStart">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPStop">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPHalt">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- codec -->
    <xsd:complexType name="tliEncode">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="val" type="Values:Value"/>
                    <xsd:choice>
                        <xsd:element name="msg" type="Types:TriMessageType"/>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                    </xsd:choice>
                    <xsd:element name="codec" type="SimpleTypes:TString"
                         minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliDecode" mixed="true">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="msg" type="Types:TriMessageType"/>
                    <xsd:choice>
                        <xsd:element name="decoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:element name="val" type="Values:Value"/>
                    </xsd:choice>
                    <xsd:element name="codec" type="SimpleTypes:TString"
                         minOccurs="0"/>
                </xsd:sequence>
```

```
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- timers -->
<xsd:complexType name="tliTTimeoutDetected">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"  />
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTTimeoutMismatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"  />
                <xsd:element name="timerTmpl" type="Templates:TciNonValueTemplate"  />
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTTimeout">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"  />
                <xsd:element name="timerTmpl" type="Templates:TciNonValueTemplate"  />
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTStart">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTStop">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTRead">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="elapsed" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTRunning">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
            </xsd:sequence>
            <xsd:attribute name="status" type="SimpleTypes:TimerStatusType"/>
        </xsd:extension>
```

```
    </xsd:complexContent>
</xsd:complexType>

<!-- scope -->
<xsd:complexType name="tliSEnter">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="kind" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliSLeave">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="returnValue" type="Values:Value" minOccurs="0"/>
                <xsd:element name="kind" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- variables and module parameter -->
<xsd:complexType name="tliVar">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="val" type="Values:Value" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliModulePar">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="val" type="Values:Value" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- verdicts -->
<xsd:complexType name="tliGetVerdict">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliSetVerdict">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue"/>
                <xsd:element name="reason" type="SimpleTypes:TString" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- log -->
<xsd:complexType name="tliLog">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
```

```
            <xsd:sequence>
                <xsd:element name="log" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- alt -->
<xsd:complexType name="tliAEnter">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliALeave">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliADefaults">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAActivate">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="ref" type="Values:Value"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliADeactivate">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="ref" type="Values:Value"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliANomatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliARepeat">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAWait">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAction">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="action" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliMatch">
    <xsd:complexContent mixed="true">
```

```
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="expr" type="Values:Value"/>
                <xsd:element name="tmpl" type="Templates:TciValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliMatchMismatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="expr" type="Values:Value"/>
                <xsd:element name="tmpl" type="Templates:TciValueTemplate"/>
                <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliInfo">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="level" type="SimpleTypes:TInteger"/>
                <xsd:element name="info" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
```

12 Use scenarios

This clause contains use scenarios that should help users of the TCI and tool vendors providing the TCI understand the semantics of the operations defined within the present document.

The scenarios are defined in terms of UML sequence diagrams. The sequence diagram shows the interactions between the TCI entities. The scenarios are explained and where applicable underpinned with a TTCN-3 fragment corresponding to the scenario.

12.1 Initialization, collecting information, logging

12.1.1 Use scenario: initialization

The scenario in figure 9 shows the initialization phase for a test system when a TTCN-3 module is to be selected for execution. At first, a root module has to be set with `tciRootModule`. The module parameters of the root module can be obtained with `tciGetModuleParameters`. Module parameter information can be used to ask the test system user for concrete values for each module parameter. The list of test cases available in the root module can be retrieved with `tciGetTestCases`. These test cases can be directly executed from the test management. Their parameters and their test system interface can be obtained with `tciGetTestCaseParameters` and `tciGetTestCaseTSI`, respectively.

12.1.1.1 Sequence diagram

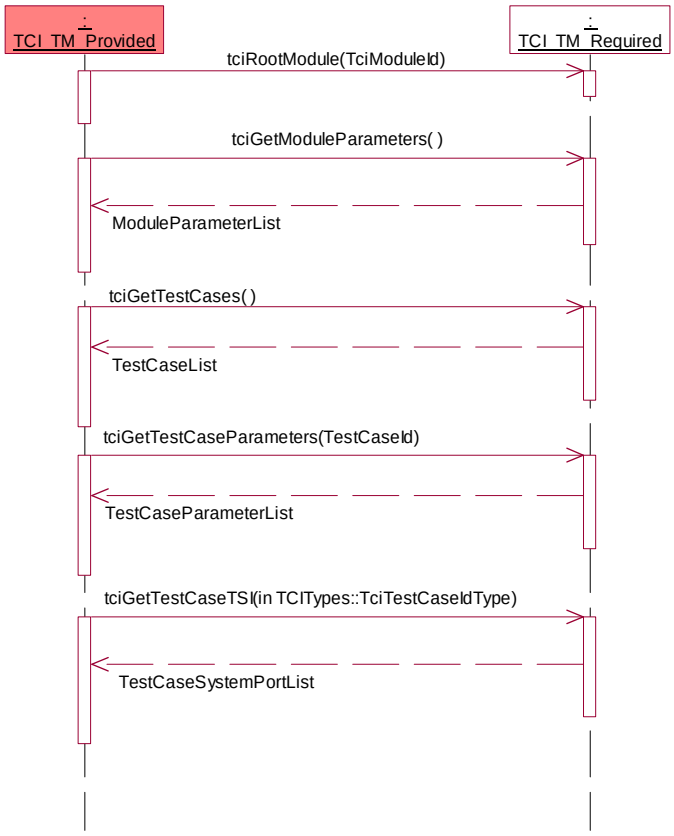

Figure 9: Use scenario - initialization

12.1.1.2 TTCN-3 fragment

The initialization is outside the scope of TTCN-3.

12.1.2 Use scenario: requesting module parameters

The scenario in figure 10 shows how a test component requests the actual value of a module parameter needed for the execution of its test behaviour. At first, the type of a module parameter is requested, then the value can be constructed by the TM and given to the TE.

12.1.2.1 Sequence diagram

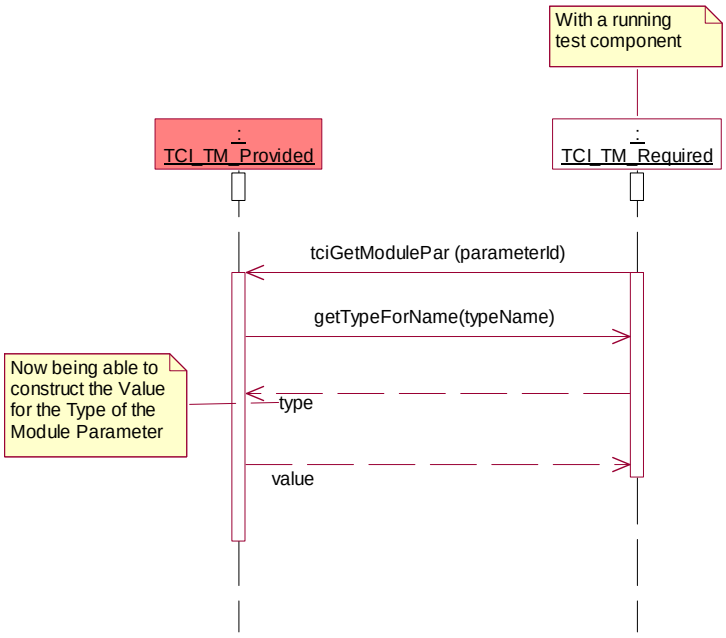

Figure 10: Use scenario - requesting module Pars

12.1.2.2 TTCN-3 fragment

```
module AModule {
    …
    modulepar {
        integer AModulePar
    }
    …
    function AFunction (…) … {
        integer x;
        …
        x:= 2+AModulePar; // an expression with a module parameter
        …
    }
    …
}
```

12.1.3 Use scenario: logging

The scenario in figure 11 shows logging of information during the execution of a test behaviour by a test component. The message to be logged is propagated to the test logging.

12.1.3.1 Sequence diagram

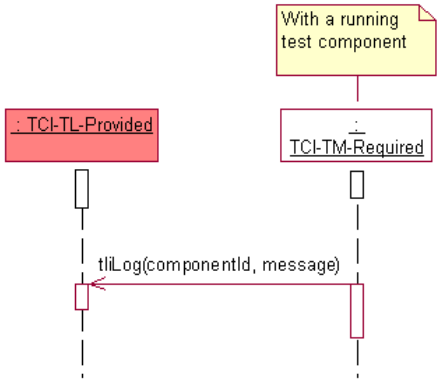

Figure 11: Use scenario - logging

12.1.3.2 TTCN-3 fragment

```
module AModule {
    …
    function AFunction (…) … {
        …
        log('AMessage');
        …
    }
    …
}
```

12.2 Execution of test cases and control

12.2.1 Use scenario: execution of control

The scenario in figure 12 shows the sequence of operations to execute the control part of a TTCN-3 module. The module containing the control part is selected first, then the control is started, then it is executed until the execution is terminated by TE.

12.2.1.1 Sequence diagram

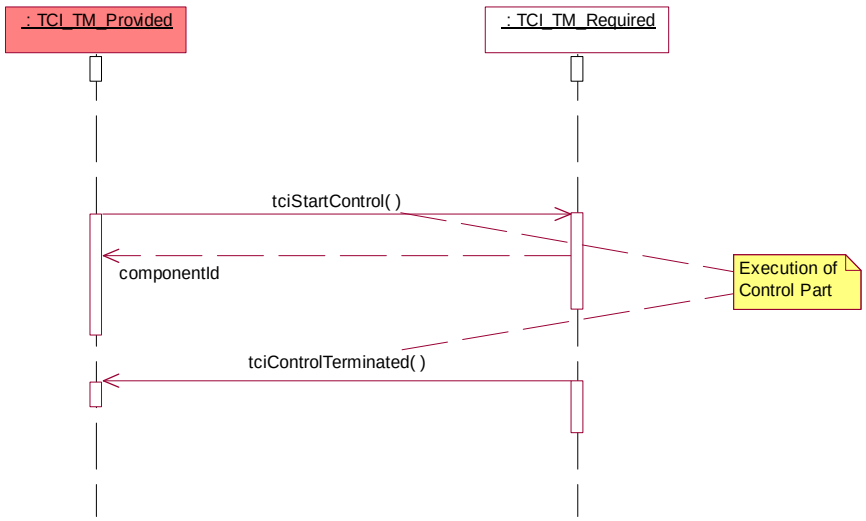

Figure 12: Use scenario - execution of control

12.2.1.2 TTCN-3 fragment

```
module AModule {
    …
    control {
        …
    }
    …
}
```

12.2.2 Use scenario: test case execution within control

The scenario in figure 13 shows how a test case is executed within the control part.

12.2.2.1 Sequence diagram

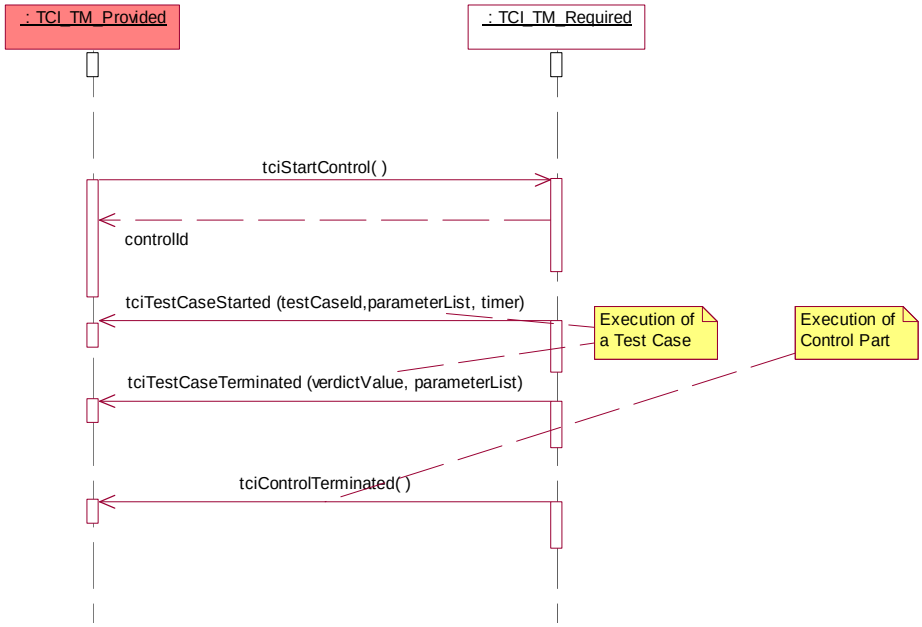

Figure 13: Use scenario - test case execution within control

12.2.2.2 TTCN-3 fragment

```
module AModule {
    …
    testcase ATestCase(…)… {
        … //the test case behaviour
    }
    …
    control {
        …
        execute(ATestCase(…));
        …
    }
    …
}
```

12.2.3 Use scenario: direct test case execution

The scenario in figure 14 shows how a test case can be directly executed from the test management outside the control part. After selecting the TTCN-3 module containing the test case to be executed, the start of the test case is requested. When the test case completes its execution, the test management is informed by the TE of the test case termination.

12.2.3.1 Sequence diagram

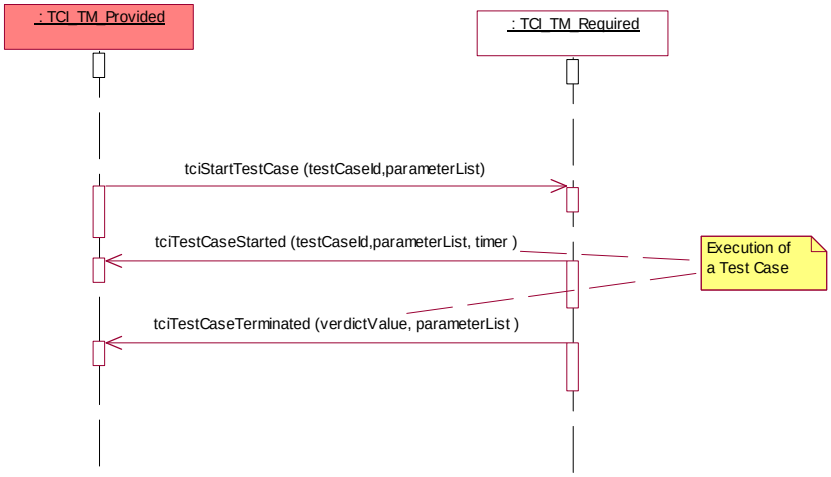

Figure 14: Use scenario - direct test case execution

12.2.3.2 TTCN-3 fragment

The direct execution of a test case is outside the scope of TTCN-3.

12.2.4 Use scenario: execute test case to TRI

The scenario in figure 15 shows how the TRI is informed about the execution of a test case so that it can set up and initialize system ports when needed. The execute test case request has to be issued before the test behaviour on the MTC of the current test case is started.

12.2.4.1 Sequence diagram

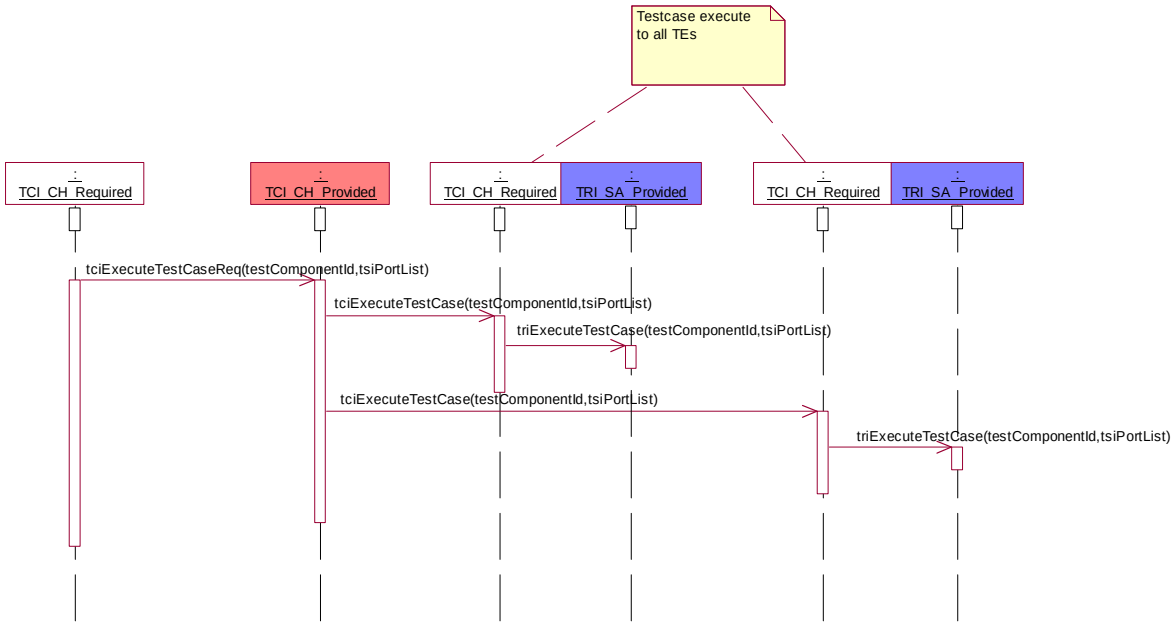

Figure 15: Use scenario - execute test case to TRI

12.2.4.2 TTCN-3 fragment

```
module AModule {
    …
    testcase ATestCase(…)… {
        … //the test case behaviour
    }
    …
    control {
        …
        execute(ATestCase(…));
        …
    }
    …
}
```

12.3 Component handling

12.3.1 Use scenario: local control component creation

The scenario in figure 16 demonstrates the creation of the control component on the same node where the user interface to the test management TCI-TM resides. A control component is created whenever the control part of a TTCN-3 module is executed. Whenever the test management TCI-TM issues the start of the control part, a create test component request is sent to the TCI-CH, which propagates it to the TE where the control component should be created. In this case it is the TE on the same node. The identifier for the control component is returned and given to the TCI-TM. The identifier is then used to start the behaviour of the control part on the control component.

12.3.1.1 Sequence diagram

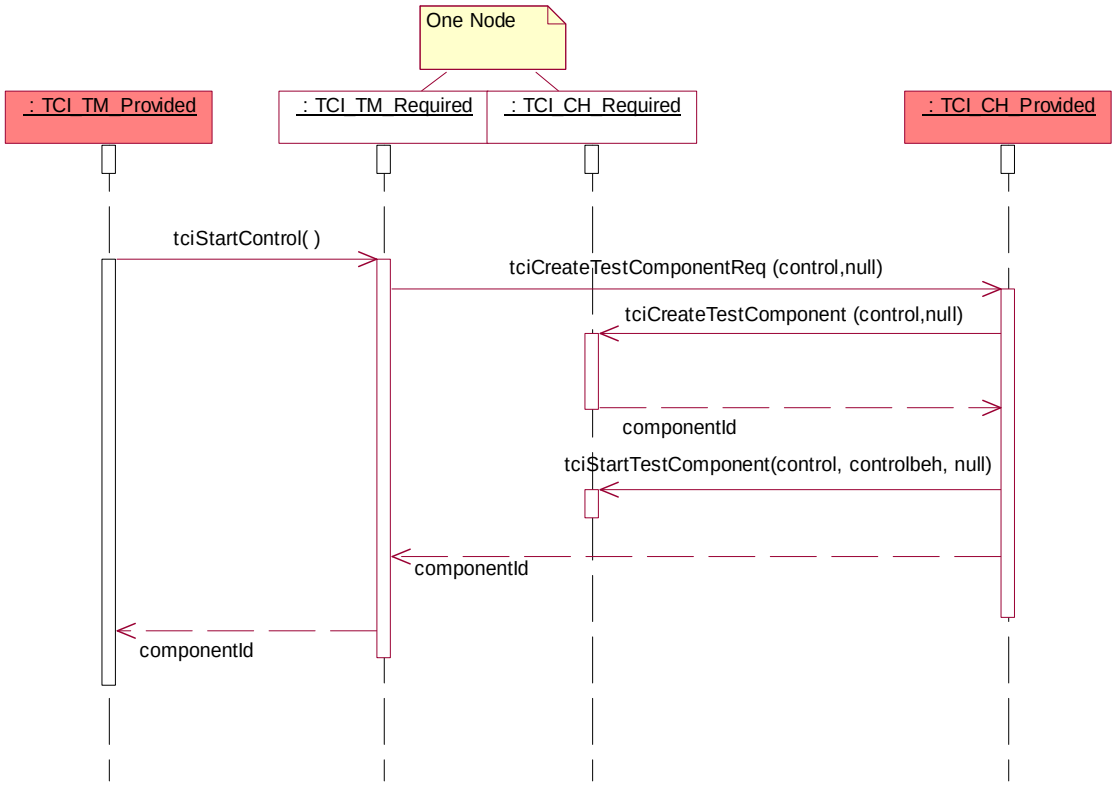

Figure 16: Use scenario - local control component creation

12.3.1.2 TTCN-3 fragment

```
module AModule {
    …
    control {
        …
    }
    …
}
```

12.3.2 Use scenario: remote control component creation

The scenario in figure 17 demonstrates the creation of the control component on another node than where the user interface to the test management TCI-TM resides. A control component is created whenever the control part of a TTCN-3 module is executed. Whenever the test management TCI-TM issues the start of the control part, a create test component request is sent to the TCI-CH, which propagates it to the TE where the control component should be created. In this case it is the TE on another remote node. The identifier for the control component is returned and given to the TCI-TM. The identifier is then used to start the behaviour of the control part on the control component.

12.3.2.1 Sequence diagram

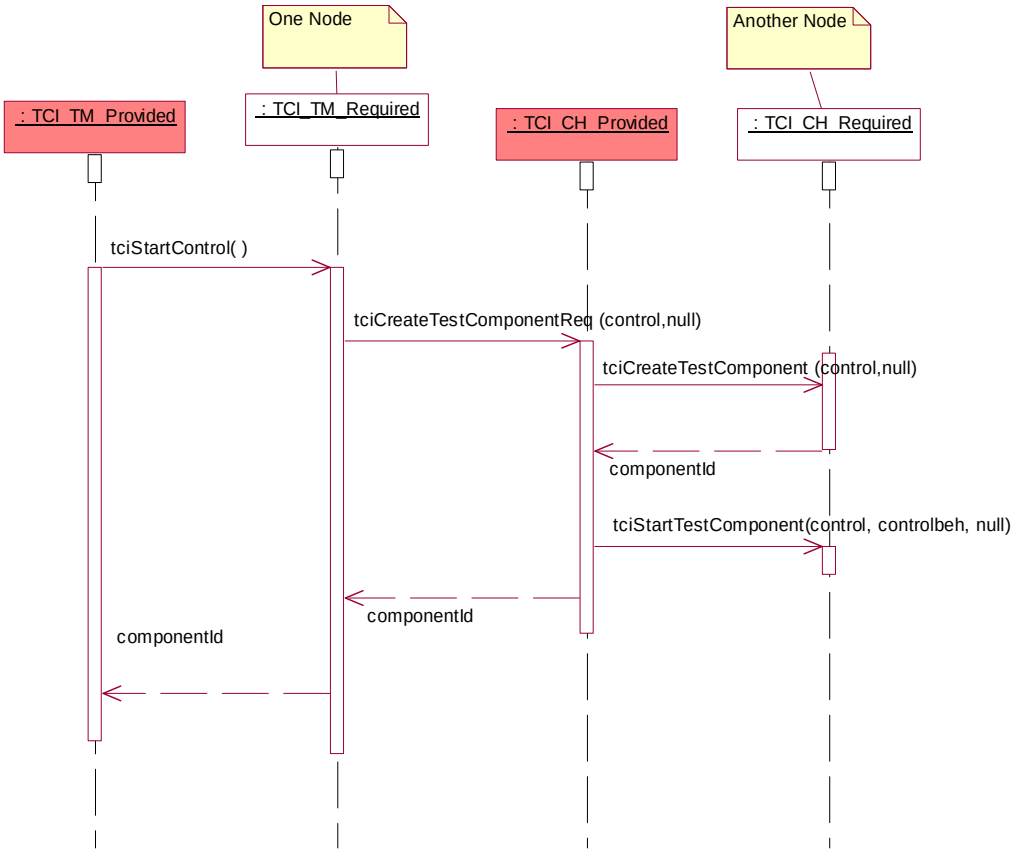

Figure 17: Use scenario - remote control component creation

12.3.2.2 TTCN-3 fragment

```
module AModule {
    …
    control {
        …
    }
    …
}
```

12.3.3 Use scenario: local MTC creation

The scenario in figure 18 demonstrates the local creation of the main test component. Local is meant for two cases:

1) on the same node where the user interface to the test management TCI-TM resides (when a test case is started directly); or

2) on the same node where the control component resides (when a test case is executed from a control part).

A main test component is created whenever a test case is executed: a create test component request is sent to the TCI-CH, which propagates it to the TE where the main test component should be created. In this case it is the TE on the same node. The identifier for the main test component is returned and given to the TCI-TM. The identifier is then used to start the test case behaviour on the main test component (this is not shown here, but handled the same way as in the scenarios described in clauses 12.3.5 and 12.3.6).

12.3.3.1 Sequence diagram

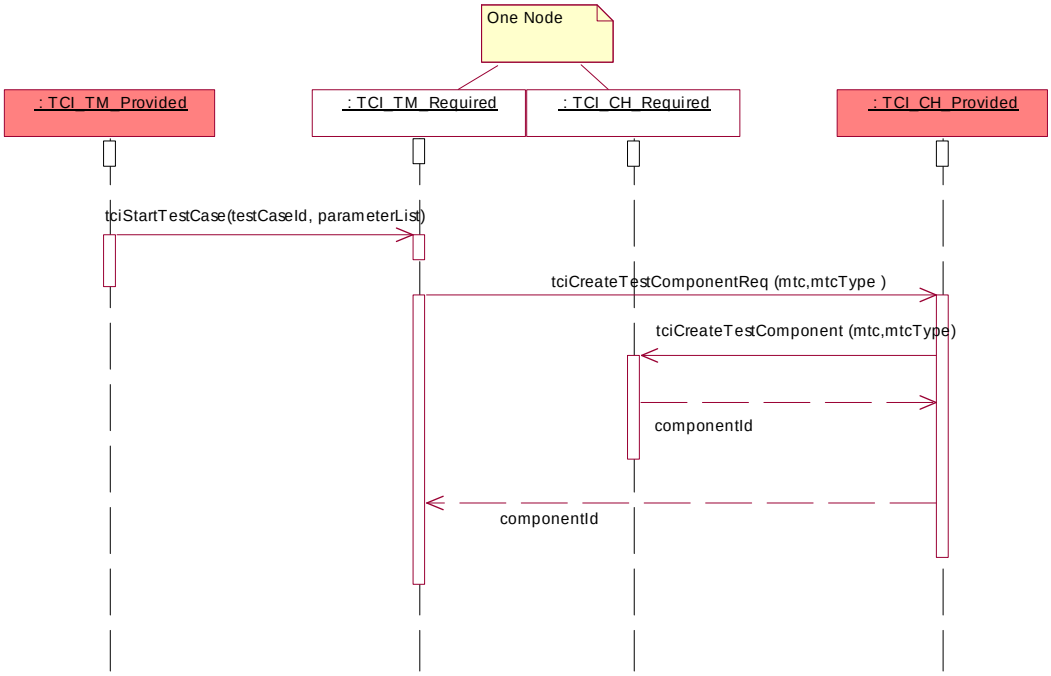

Figure 18: Use scenario - local MTC creation

12.3.3.2 TTCN-3 fragment

```
module AModule {
    …
    testcase ATestCase (…) runs on MTCType… {
        … //the test case behaviour
    }
    …
}
```

12.3.4 Use scenario: remote MTC creation

The scenario in figure 19 demonstrates the remote creation of the main test component. Remote is meant for two cases:

1) on another node than where the user interface to the test management TCI-TM resides (when a test case is started directly); or

2) on another node than where the control component resides (when a test case is executed from a control part).

A main test component is created whenever a test case is executed: a create test component request is sent to the TCI-CH, which propagates it to the TE where the main test component should be created. In this case it is the TE on another node. The identifier for the main test component is returned and given to the TCI-TM. The identifier is then used to start the test case behaviour on the main test component (this is not shown here, but handled the same way as in the scenarios described in clauses 12.3.5 and 12.3.6).

12.3.4.1 Sequence diagram

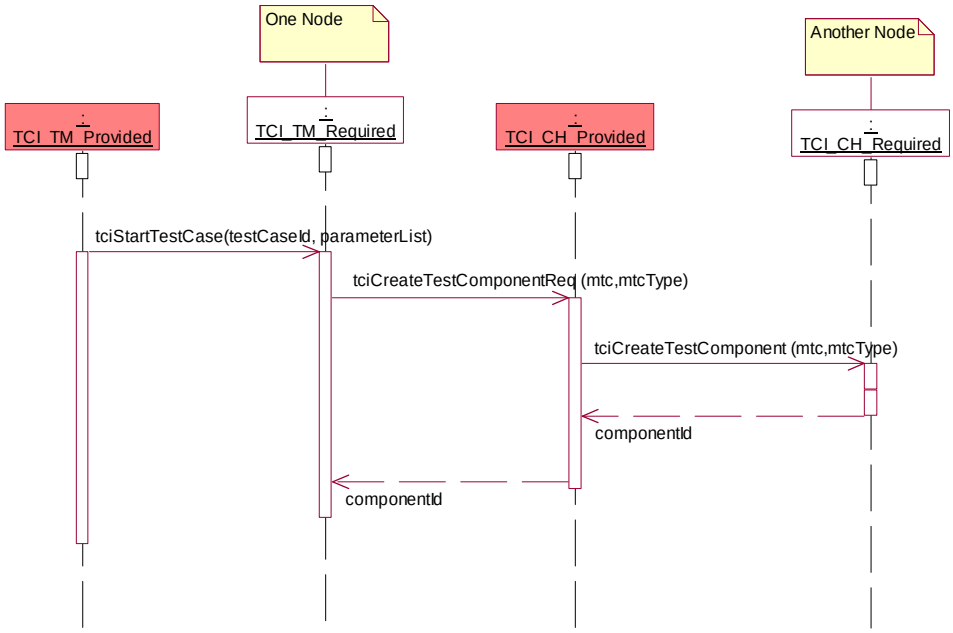

Figure 19: Use scenario - remote MTC creation

12.3.4.2 TTCN-3 fragment

```
module AModule {
    …
    testcase ATestCase(…)runs on MTCType … {
        … //the test case behaviour
    }
    …
}
```

12.3.5 Use scenario: component handling for test case execution within control

The scenario in figure 20 demonstrates the handling of components for the test case execution within a control part. When the control part is started, a control component is created and its component identifier returned to the test management. For each test case to be executed within the control part, a main test component is created and the component identifier returned to the control component. Afterwards, the test case behaviour is started on the main test component and the test management is informed about the start of the test case. When the main test component terminates, a request for the main test component termination together with the local verdict of the main test component is propagated to enable the derivation of the global test verdict and to enable the information about the test case termination.

12.3.5.1 Sequence diagram

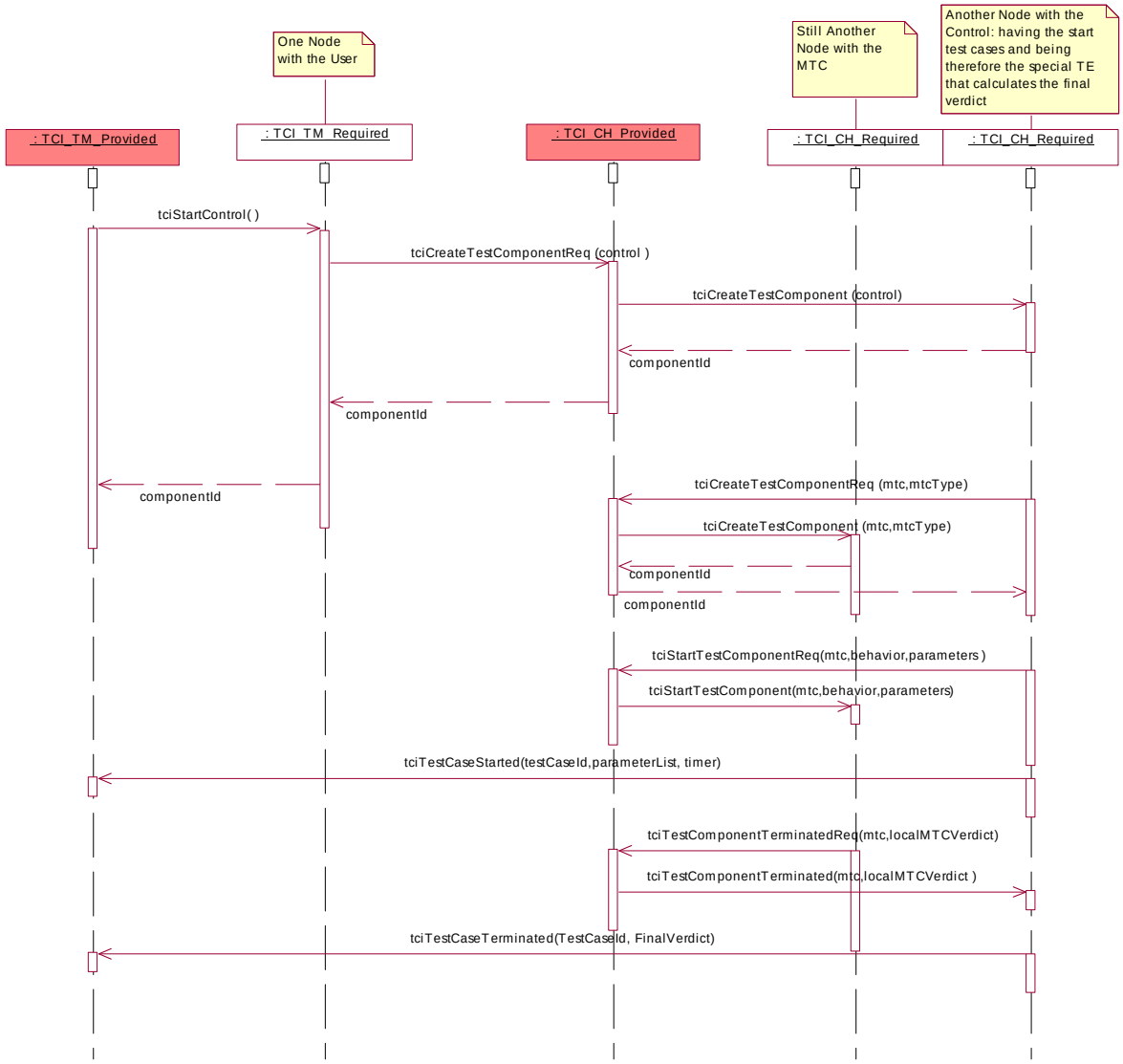

Figure 20: Use scenario: component handling for test case execution within control

12.3.5.2 TTCN-3 fragment

```
module AModule {
    …
    testcase ATestCase(…)… {
        … //the test case behaviour
    }
    …
    control {
        …
        execute(ATestCase(…));
        …
    }
    …
}
```

12.3.6 Use scenario: component handling for direct test case execution

The scenario in figure 21 shows how test components are handled when a test case is executed directly, i.e. outside a control part. When a test case is started, the main test component is created and the test case behaviour started on this main test component at first. Whenever a parallel test component is used within a test case, it is handled the same: the parallel test component is started first: giving a test component create request to the TCI-CH entity, which propagates the test component create to the TE in which the parallel test component shall be created. The identifier for the created parallel test component is returned. The identifier is then used to start the PTC behaviour for the start operation. When the PTC terminates its execution, a test component terminate request together with the local test verdict is issued to inform TCI-CH about this termination. The same is done when the main test component terminates. In addition, the termination of the main test component leads to the overall termination of the test case.

12.3.6.1 Sequence diagram

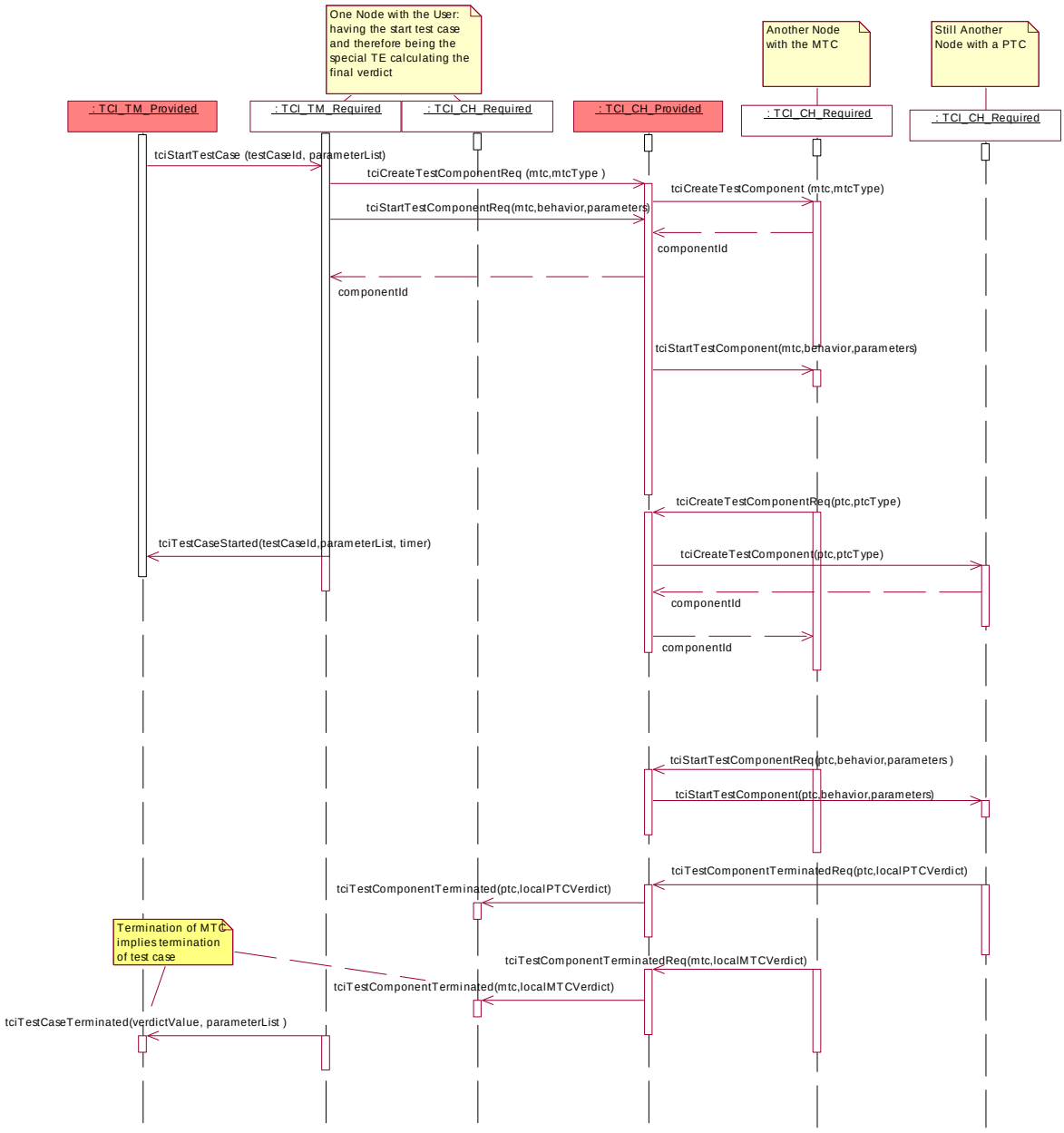

Figure 21: Use scenario: component handling for direct test case execution

12.3.6.2 TTCN-3 fragment

```
module AModule {
    …
    function APTCBehaviour(…) runs on APTCType {
        … //the PTC behaviour
    }
    …
    testcase ATestCase(…)… {
        … //the test case behaviour
        var APTCType PTC:= APTCType.create;
        …
        PTC.start(APTCBehaviour(…));
        …
    }
    …
}
```

12.3.7 Use scenario: propagation of map/connect

The scenario in figure 22 shows how ports are mapped. The request to map a port is propagated to the TE where the map is finally performed. The propagation of connect requests works analogously.

12.3.7.1 Sequence diagram

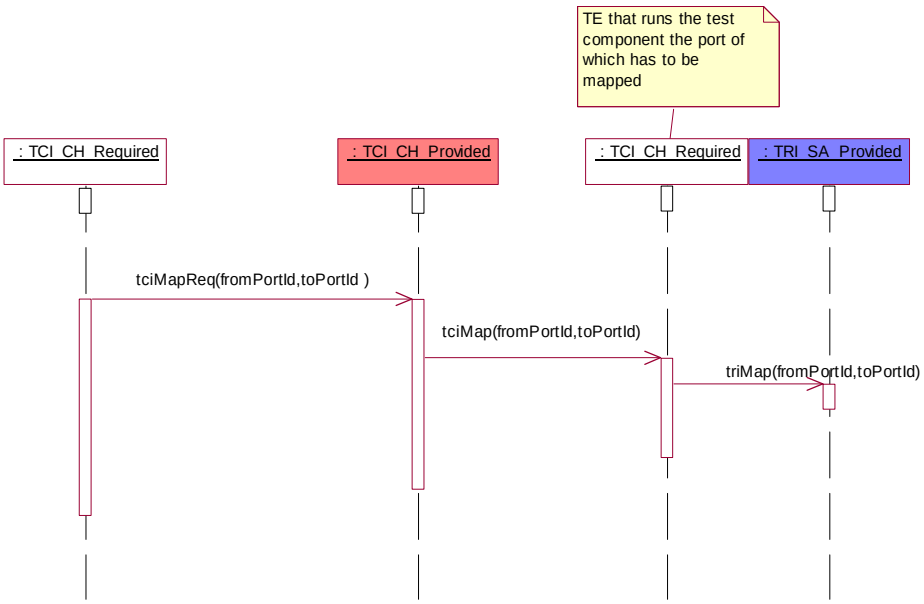

Figure 22: Use scenario: propagation of map

12.3.7.2 TTCN-3 fragment

```
module AModule {
    …
    type port A { … }
    type component CA { port A a }
        type component CB { port A a }
    …
    testcase ATestCase(…)runs on CA system CB {
        var CA ptc := CA.create;
        … //the test case behaviour
        map(ptc:a, System:a);
        …
    }
    …
}
```

12.3.8 Use scenario: propagation of unmap/disconnect

The scenario in figure 23 shows how ports are unmapped. The request to unmap a port is propagated to the TE where the unmap is finally performed. The propagation of disconnect requests works analogously.

12.3.8.1 Sequence diagram

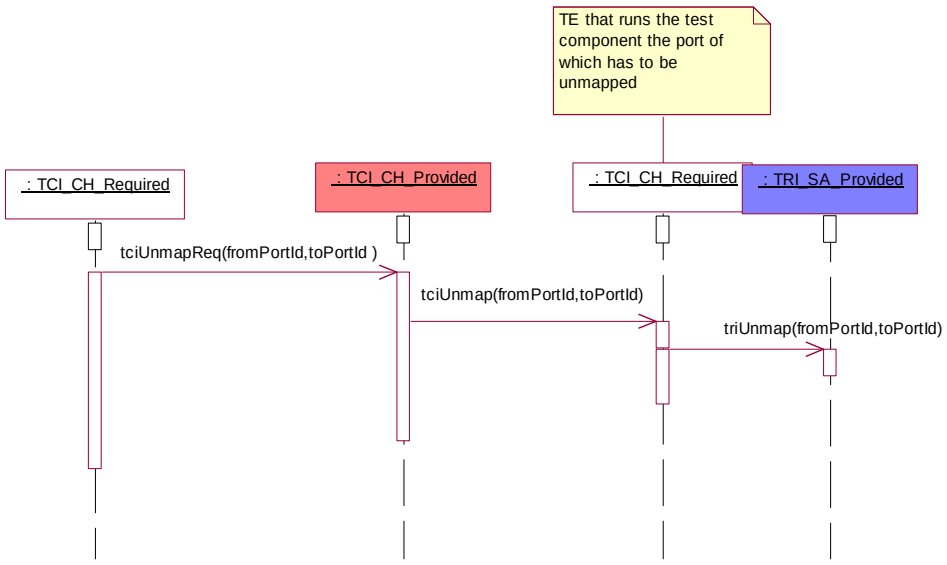

Figure 23: Use scenario - propagation of map

12.3.8.2 TTCN-3 fragment

```
module AModule {
    …
    type port A { … }
    type component CA { port A a }
    type component CB { port A a }
    …
    testcase ATestCase(…)runs on CA system CB {
        var CA ptc := CA.create;
        … //the test case behaviour
        unmap(ptc:a,system:a);
        …
    }
    …
}
```

12.4 Termination of test cases and control

12.4.1 Use scenario: stop a test case

The scenario in figure 24 shows how a test case is stopped from the test management during test case execution. Once the TM has received information about a started test case, a stop test case can be requested up until receiving the information that the test case has been terminated. Upon stopping a test case, all parallel test components will be stopped and the test system will be reset.

12.4.1.1 Sequence diagram

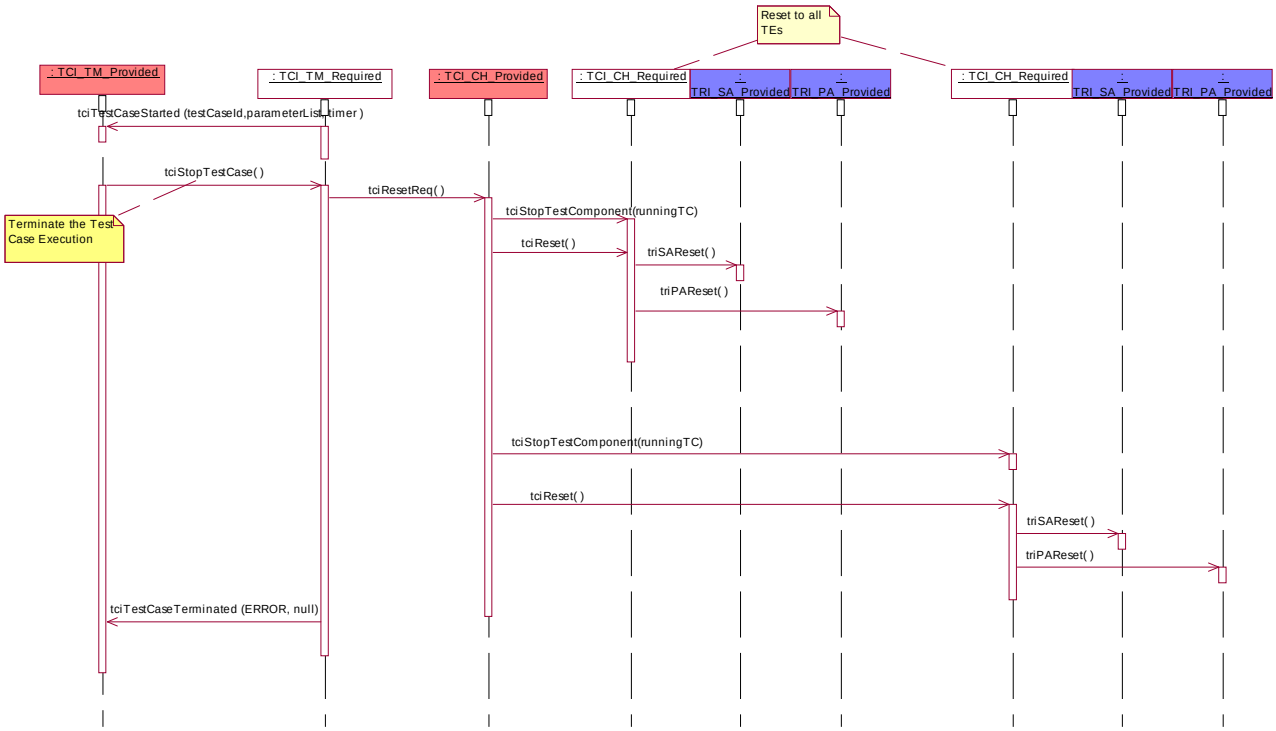

Figure 24: Use scenario: stop a test case

12.4.1.2 TTCN-3 fragment

There is no TTCN-3 code related to how the TM chooses to implement test case termination. This is outside the scope of TTCN-3.

12.4.2 Use scenario: stop control

The scenario in figure 25 shows how a control part is stopped from the test management during control part execution. A control part can be stopped in between starting the control and its termination. If the control part receives a stop test case request while a test case is executing, the executing test case shall be stopped. Furthermore, the test system shall be reset as described in figure 24.

12.4.2.1 Sequence diagram

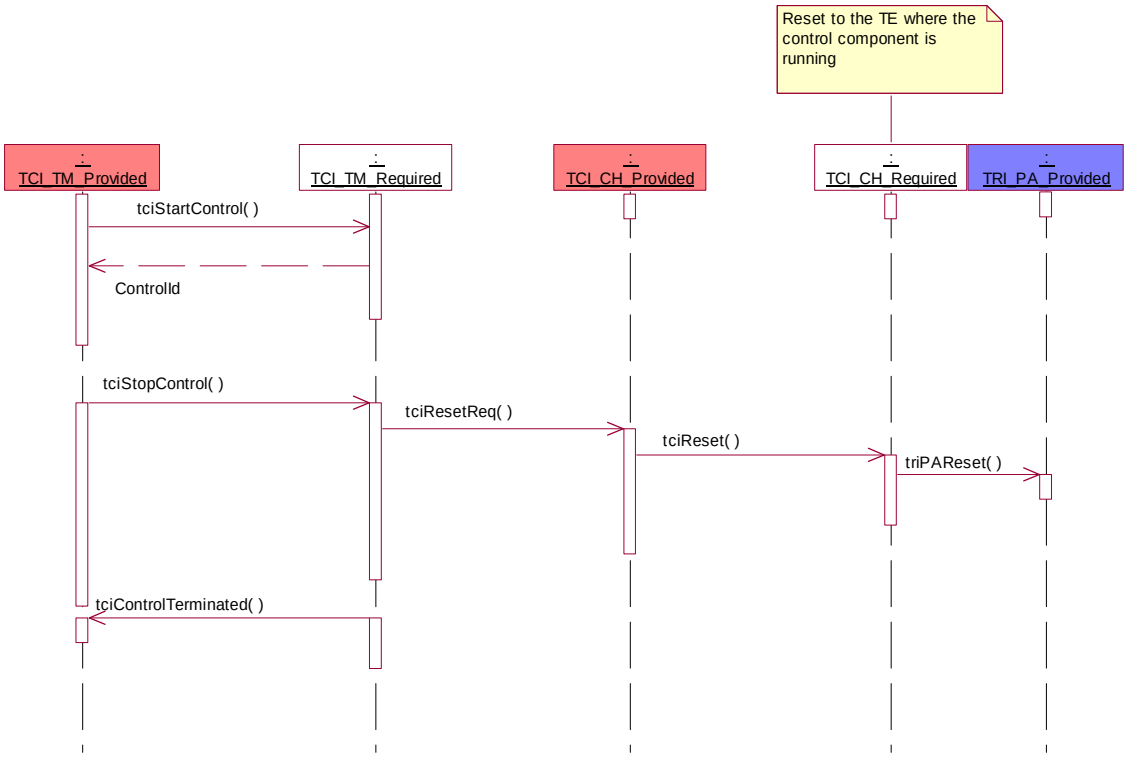

Figure 25: Use scenario - stop control

12.4.2.2 TTCN-3 fragment

Stopping a control part from the test management is outside the scope of TTCN-3 so that no TTCN-3 fragment exists.

12.4.3 Use scenario: termination of control after error

The scenario in figure 26 shows the handling of error situations during the execution of a control part when no test case is being executed. The test management is informed about the error situation and has then to terminate the execution of the control part explicitly. Upon termination of the control part, the test system will be reset.

12.4.3.1 Sequence diagram

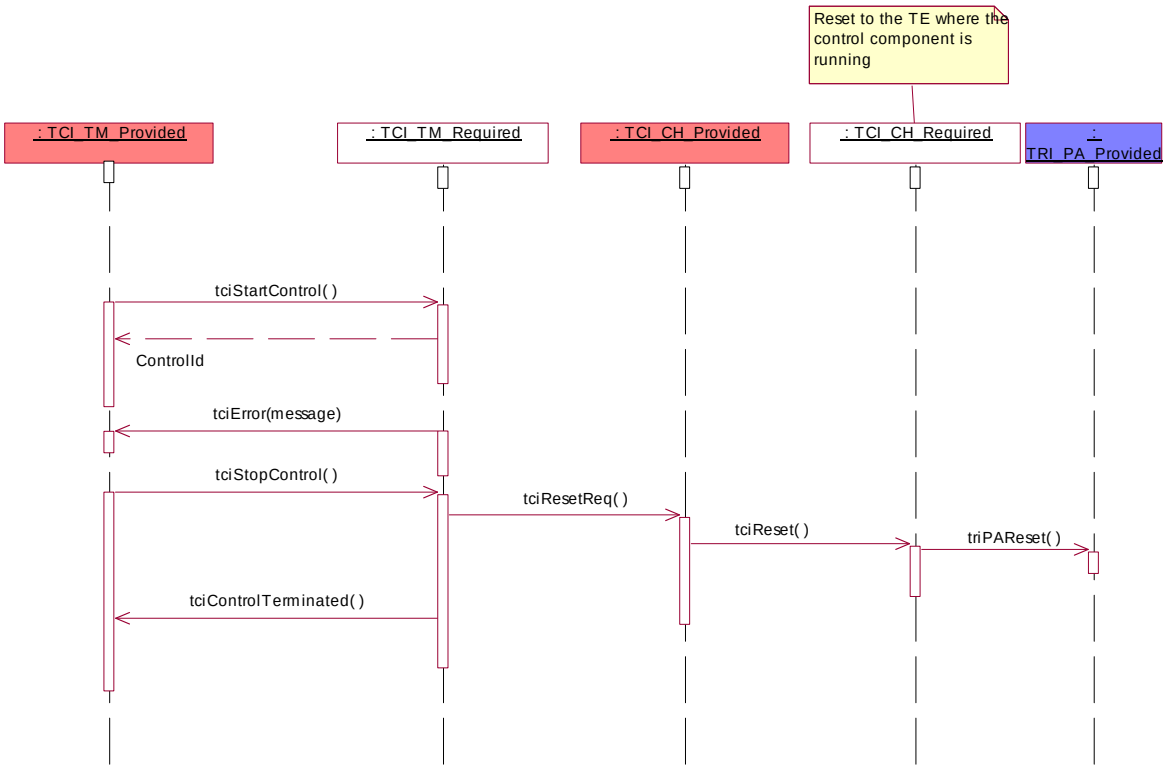

Figure 26: Use scenario - termination of control after error

12.4.3.2 TTCN-3 fragment

There is no TTCN-3 fragment for this scenario since error situations are exceptional cases in a test system and not a TTCN-3 concept as such. Rather, the TTCN-3 semantics describes various potential error situations in a test system.

12.4.4 Use scenario: termination of a test case after error

The scenario in figure 27 shows the handling of error situations during the direct execution of a test case. The test management is informed about the error situation. The TM must then explicitly terminate test case execution. Upon stopping a test case, the parallel test components will be stopped and the test system shall be reset.

12.4.4.1 Sequence diagram

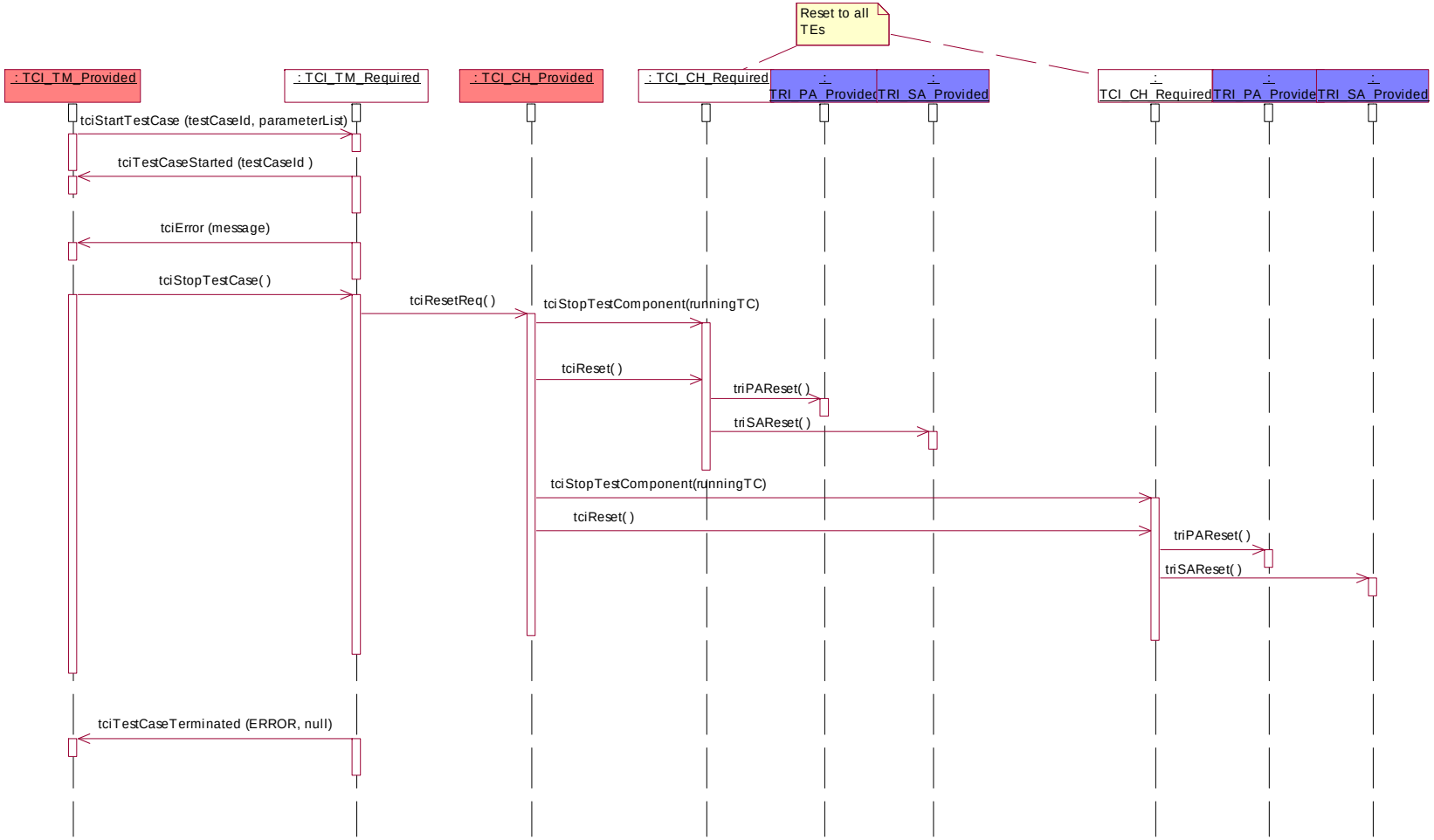

Figure 27: Use scenario - termination of a test case after error

12.4.4.2 TTCN-3 fragment

There is no TTCN-3 fragment for this scenario since error situations are exceptional cases in a test system and not a TTCN-3 concept as such. Rather, the TTCN-3 semantics describes various potential error situations in a test system.

12.4.5 Use scenario: reset

The scenario in figure 28 shows the reset of the test system. In that case all involved TEs together with their TRI System Adaptors (SA) and Platform Adaptors (PA) are reset.

12.4.5.1 Sequence diagram

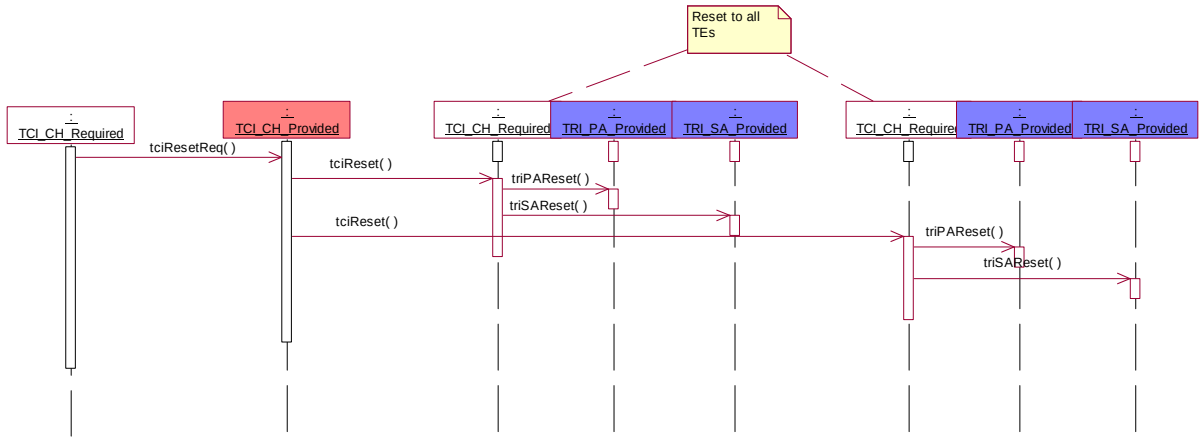

Figure 28: Use scenario - reset

12.4.5.2 TTCN-3 fragment

There is no TTCN-3 fragment for this scenario since reset as required after error situations are exceptional cases in a test system and not a TTCN-3 concept as such.

12.5 Communication

11.5.1 Use scenario: local intercomponent communication

The scenario in figure 29 shows the communication between test components (main test component or parallel test components), which reside on the same node. A communication request is given to the TCI-CH, which then decide where to enqueue this communication template. In this case, the communication is done locally via the TE on the same node. The scenario shows a message-based communication using the send operation - the scenario is the same for call, reply, and raise operations.

12.5.1.1 Sequence diagram

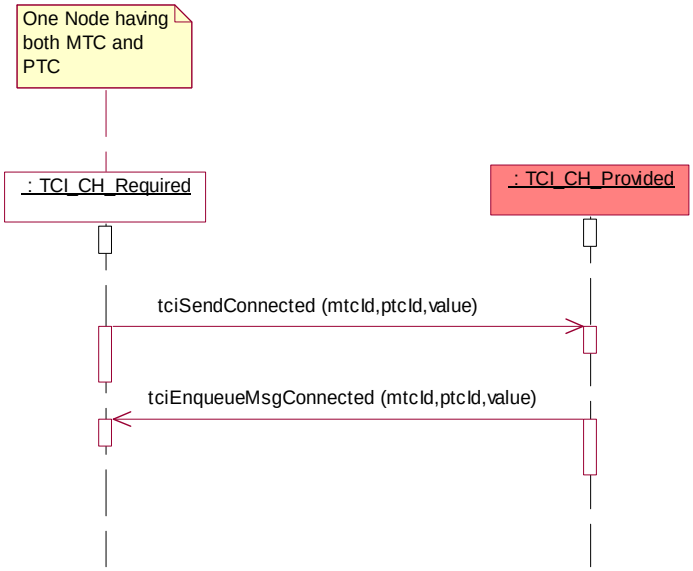

Figure 29: Use scenario - local intercomponent communication

12.5.1.2 TTCN-3 fragment

```
module AModule {
    …
    type port APortType message { … }
    …
    type component ATCType {
        …
        APortType APort;
        …
    }
    …
    template AType AMessageTemplate { … }
    …
    function APTCBehaviour(…) runs on APTCType {
        … //the PTC behaviour
    …
    }
    …
    testcase ATestCase(…) runs on ATCType… {
        … //the test case behaviour
        var ATCType PTC1:= ATCType.create;
        connect(PTC1:APort,mtc:APort);
        …
        PTC1.start(APTCBehaviour(…));
        APort.send(AMessageTemplate); //sending data to a test component
        …
    }
    …
}
```

12.5.2 Use scenario: internode communication between test components

The scenario in figure 30 shows the communication between test components (main test component or parallel test components), which reside on different nodes. A communication request is given to the TCI-CH, which then decides where to enqueue this communication template. In this case, the communication is done remotely via the TE on another node. The scenario shows a message based communication using the send operation - the scenario is the same for call, reply, and raise operations.

12.5.2.1 Sequence diagram

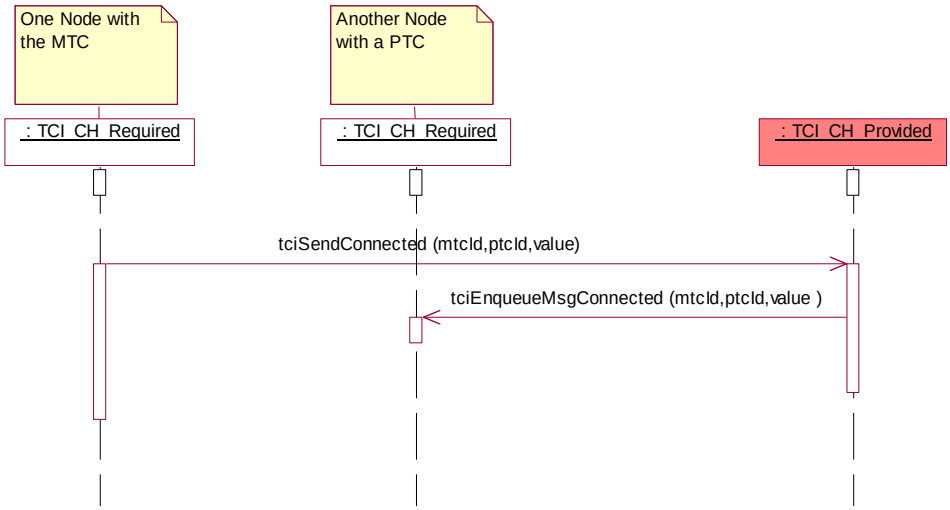

Figure 30: Use scenario - internode communication between test components

12.5.2.2 TTCN-3 fragment

```
module AModule {
    …
    type port APortType message { … }
    …
    type component ATCType {
        …
        APortType APort;
        …
    }
    …
    template AType AMessageTemplate { … }
    …
    function APTCBehaviour(…) runs on APTCType {
        … //the PTC behaviour
    …
    }
    …
    testcase ATestCase(…) runs on ATCType… {
        … //the test case behaviour
        var ATCType PTC1:= ATCType.create;
        connect(PTC1:APort,mtc:APort);
        …
        PTC1.start(APTCBehaviour(…));
        APort.send(AMessageTemplate); //sending data to a test component
        …
    }
    …
}
```

12.5.3 Use scenario: encoding

The scenario in figure 31 shows the encoding of data, which is sent to the SUT. The encoded data is received from the coding/decoding entity via the TCI-CD. The encoded value is sent to the SUT via the TRI-SA. The scenario is the same for the call, the reply, and the raise operations.

12.5.3.1 Sequence diagram

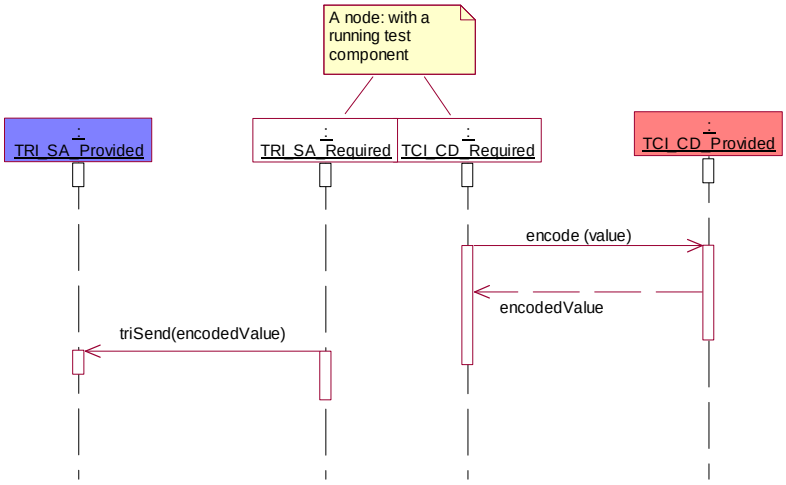

Figure 31: Use scenario - encoding

12.5.3.2 TTCN-3 fragment

```
module AModule {
    …
    type port APortType message { … }
    …
    type component APTCType {
        …
        APortType APort;
        …
    }
    …
    template AType AMessageTemplate { … }
    …
    testcase ATestCase(…) runs on APTCType system APTCType {
        … //the test case behaviour
        map(mtc:APort,system:APort);
        …
        APort.send(AMessageTemplate); //sending data to the SUT
        …
    }
    …
} with { encoding = '…' }
```

12.5.4 Use scenario: decoding

The scenario in figure 32 shows the decoding of data, which is received from the SUT via the TRI-SA. The decoded data is received from the coding/decoding entity via the TCI-CD. The scenario is the same for the receive, the getcall, the getreply, the catch, and the check operations.

12.5.4.1 Sequence diagram

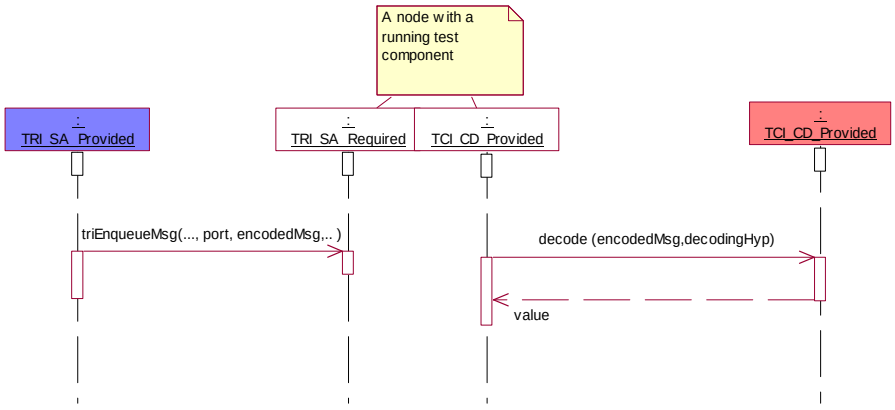

Figure 32: Use scenario - decoding

12.5.4.2 TTCN-3 fragment

```
module AModule {
    …
    type port APortType message { … }
    …
    type component APTCType {
        …
        APortType APort;
        …
    }
    …
    template AType AMessageTemplate { … }
    …
    testcase ATestCase(…) runs on APTCType system APTCType {
        … //the test case behaviour
        map(mtc:APort,system:APort);
        …
        APort.receive(AMessageTemplate); //receiving data from the SUT
        …
    }
    …
} with { encoding = '…' }
```

Annex A (normative): IDL Specification of TCI

This annex defines the TTCN-3 Control Interfaces using the Interface Definition Language (IDL).

```
// ********************************************************************************
// * Interface definitions for the TTCN-3 Control Interfaces
// ********************************************************************************

module tciInterface {

  /* Forward declaration */
  interface Value;
  interface Type;

  // ********************************************************************************
  // * Data types taken from the TRI definitions
  // ********************************************************************************

  // Connection
  native TriPortIdType ;
  native TriPortIdListType;
  native TriComponentIdType ;
  native TriComponentIdListType;

  // Communications
  native TriMessageType;
  native TriParameterType;
  native TriParameterListType;
  native TriAddressType;
  native TriAddressListType;
  native TriExceptionType;
  native TriSignatureIdType;

  // Miscellaneous
  native TriStatusType;
  native TriTimerIdType;
  native TriTimerDurationType;

  native TciStatusType;

  // ********************************************************************************
  // * General Abstract Data Types
  // ********************************************************************************

  // Basic definitions
  native TBoolean;
  native TFloat;
  native TChar;
  native TInteger;
  native TString;
  native TUniversalChar;
  typedef sequence <TString> TStringSeq;

  struct QualifiedName {
    TString moduleName;
    TString baseName;
  };

  // General TCI abstract data types
  typedef QualifiedName TciBehaviourIdType;
  typedef QualifiedName TciModuleIdType;
  typedef QualifiedName TciModuleParameterIdType;
  typedef QualifiedName TciTestCaseIdType;

  enum TciParameterPassingModeType {
    IN_MODE,
    OUT_MODE,
    INOUT_MODE
  };

  struct TciParameterType {
    TciModuleParameterIdType parameterName;
    Value parameterValue;
```

```
  TciParameterPassingModeType mode;
};

typedef sequence <TciParameterType> TciParameterListType;

struct TciParameterTypeType {
  Type parameterType;
  TciParameterPassingModeType mode;
};

typedef sequence <TciParameterTypeType> TciParameterTypeListType;

struct TciModuleParameterType {
  TciModuleParameterIdType parameterName;
  Value defaultValue;
};

typedef sequence <TciModuleIdType> TciModuleIdListType ;

typedef sequence <TciModuleParameterType> TciModuleParameterListType;

typedef sequence <TciTestCaseIdType> TciTestCaseIdListType;


enum TciTestComponentKindType {
  CONTROL,
  MTC,
  PTC,
  SYSTEM,
  PTC_ALIVE
};

enum ComponentStatusType{
  inactiveC,
  runningC,
  stoppedC,
  killedC
};

enum TimerStatusType{
  runningT,
  inactiveT,
  expiredT
};

enum PortStatusType{
  startedP,
  haltedP,
  stoppedP
};

enum TciTypeClassType {
  ADDRESS_CLASS,
  ANYTYPE_CLASS,
  BITSTRING_CLASS,
  BOOLEAN_CLASS,
  CHAR_CLASS,
  CHARSTRING_CLASS,
  COMPONENT_CLASS,
  ENUMERATED_CLASS,
  FLOAT_CLASS,
  HEXSTRING_CLASS,
  INTEGER_CLASS,
  OCTETSTRING_CLASS,
  RECORD_CLASS,
  RECORDOF_CLASS,
  ARRAY_CLASS,
  SET_CLASS,
  SETOF_CLASS,
  UNION_CLASS,
  UNIVERSALCHAR_CLASS,
  UNIVERSALCHARSTRING_CLASS,
  VERDICT_CLASS
};
```

```
// ********************************************************************************
// * Abstract TTCN-3 Data Types And Values
// ********************************************************************************

// Abstract data type "Type"
interface Type {
  TciModuleIdType  getDefiningModule ();
  TString          getName ();
  TciTypeClassType getTypeClass ();
  Value            newInstance ();
  TString          getTypeEncoding ();
  TString          getTypeEncodingVariant ();
  TStringSeq       getTypextension ();
};

// Abstract TTCN-3 Values
interface Value {
  TString  getValueEncoding ();
  TString  getValueEncodingVariant ();
  Type     getType ();
  TBoolean  notPresent ();
};

interface RecordOfValue : Value {
  Value    getField (in TInteger position);
  void     setField (
           in TInteger position,
           in Value value
             );
  void     appendField (in Value value);
  Type     getElementType ();
  TInteger getLength ();
  void     setLength (in TInteger len);
  TInteger getOffset ();
};

interface RecordValue : Value {
  Value      getField (in TString fieldName);
  void       setField (
           in TString fieldName,
           in Value value
           );
  TStringSeq getFieldNames ();
  void       setFieldOmitted (in TString fieldName);
};

interface VerdictValue : Value {
  TInteger getVerdict ();
  void     setVerdict (in TInteger verdict);
};

interface BitstringValue : Value {
  TString   getString ();
  void      setString (in TString value);
  TInteger  getBit (in TInteger position);
  void      setBit (
           in TInteger position,
           in TInteger value
           );
  TInteger  getLength ();
  void      setLength (in TInteger len);
};

interface OctetstringValue : Value {
  TString  getString ();
  void     setString (in TString value);
  TInteger getOctet (in TInteger position);
  void     setOctet (
           in TInteger position,
           in TInteger value
           );
  TInteger getLength ();
  void     setLength (in TInteger len);
};

interface FloatValue : Value {
  TFloat getFloat ();
  void  setFloat (in TFloat value);
```

```
};

interface HexstringValue : Value {
  TString  getString ();
  void     setString (in TString value);
  TInteger getHex (in TInteger position);
  void     setHex (
           in TInteger position,
           in TInteger value
           );
  TInteger getLength ();
  void     setLength (in TInteger len);
};

interface EnumeratedValue : Value {
  void    setEnum (in TString enumValue);
  TString getEnum ();
};

interface IntegerValue : Value {
  TInteger getInt ();
  void     setInt (in TInteger value);
};

interface CharValue : Value {
  TChar getChar ();
  void  setChar (in TChar value);
};

interface CharstringValue : Value {
  TString  getString ();
  void     setString (in TString value);
  TChar    getChar   (in TInteger position);
  void     setChar   (
           in TInteger position,
           in TChar value
           );
  TInteger getLength ();
  void     setLength (in TInteger len);
};

interface BooleanValue : Value {
  TBoolean getBoolean ();
  void    setBoolean (in TBoolean value);
};

interface UniversalCharValue : Value {
  TUniversalChar getUniversalChar ();
  void           setUniversalChar (in TUniversalChar value);

};

interface UniversalCharstringValue : Value {
  TString        getString ();
  void           setString (in TString value);
  TUniversalChar getChar   (in TInteger position);
  void           setChar   (
           in TInteger position,
           in TUniversalChar value
           );
  TInteger       getLength ();
  void           setLength (in TInteger len);
};

interface UnionValue : Value {
  Value      getVariant  (in TString variantName);
  void       setVariant  (
           in TString variantName,
           in Value value
           );
  TString    getPresentVariantName ();
  TStringSeq getVariantNames ();

};
```

```
// ********************************************************************
// * Abstract Logging Types
// ********************************************************************

interface TciValueTemplate : Value {
    TBoolean isOmit ();
    TBoolean isAny();
    TBoolean isAnyOrOmit();
    TString getTemplateDef();
};

interface TciNonValueTemplate {
    TBoolean isAny();
    TBoolean isAll();
    TString getTemplateDef();
};

typedef sequence <Value> TciValueListType;

struct TciValueDifferenceType
{
  TString desc;
  Value val;
  TciValueTemplate tmpl;
};

typedef sequence <TciValueDifferenceType> TciValueDifferenceListType;

interface TciValueList {
  attribute TciValueListType inst;
  TInteger size();
  TBoolean isEmpty();
  Value get(in TInteger index);
};

interface TciValueDifference {
  attribute TciValueDifferenceType inst;
  Value getValue();
  TciValueTemplate getTciValueTemplate();
  TString getDescription();
};

interface TciValueDifferenceList {
  attribute TciValueDifferenceListType inst;
  TInteger size();
  TBoolean isEmpty();
  TciValueDifference get(in TInteger index);
};

// ********************************************************************************
// Coding Decoding Interface
// -  Required
// ********************************************************************************

interface TCI_CD_Required {
  Type getTypeForName (in TString typeName);
  Type getInteger ();
  Type getFloat ();
  Type getBoolean ();
  Type getChar ();
  Type getUniversalChar ();
  Type getCharstring ();
  Type getUniversalCharstring ();
  Type getHexstring ();
  Type getBitstring ();
  Type getOctetstring ();
  Type getVerdict ();
  void tciErrorReq (in TString message);
};

// ********************************************************************************
// Coding Decoding interface
// -  Provided
// ********************************************************************************

interface TCI_CD_Provided {
  Value decode (
        in TriMessageType message,
```

```
        in Type decodingHypothesis
        );
  TriMessageType encode (in Value value);
};


// ********************************************************************************
// Test Management Interface
// -  Required
// ********************************************************************************

interface TCI_TM_Required : TCI_CD_Required {
  void tciRootModule (in TciModuleIdType moduleName);
  TciModuleIdListType tciGetImportedModules();
  TciModuleParameterListType tciGetModuleParameters (in TciModuleIdType moduleName);
  TciTestCaseIdListType tciGetTestCases ();
  TciParameterTypeListType tciGetTestCaseParameters (
          in TciTestCaseIdType testCaseId
          );
  TriPortIdListType tciGetTestCaseTSI (
          in TciTestCaseIdType testCaseId
          );
  void tciStartTestCase (
          in TciTestCaseIdType testCaseId,
          in TciParameterListType parameterList
          );
  void tciStopTestCase ();
  TriComponentIdType tciStartControl ();
  void tciStopControl ();
};

// ********************************************************************************
// Test Management Interface
// -  Provided
// ********************************************************************************

interface TCI_TM_Provided {
  void tciTestCaseStarted (
          in TciTestCaseIdType testCaseId,
          in TciParameterListType parameterList,
          in TFloat timer
          );
  void tciTestCaseTerminated (
          in VerdictValue verdict,
          in TciParameterListType parameterList
          );
  void tciControlTerminated ();
  Value tciGetModulePar (
          in TciModuleParameterIdType parameterId
          );
  void tciLog (
       in TriComponentIdType testComponentId,
       in TString message
       );
  void tciError (in TString message);
};


// ********************************************************************************
// Component Handling Interface
// -  Required
// ********************************************************************************

interface TCI_CH_Required : TCI_CD_Required {
  void tciEnqueueMsgConnected (
          in TriPortIdType sender,
          in TriComponentIdType receiver,
          in Value receivedMessage
          );
  void tciEnqueueCallConnected (
          in TriPortIdType sender,
          in TriComponentIdType receiver,
          in TriSignatureIdType signature,
          in TciParameterListType parameterList
          );
  void tciEnqueueReplyConnected (
          in TriPortIdType sender,
          in TriComponentIdType receiver,
```

```
          in TriSignatureIdType signature,
          in TciParameterListType parameterList,
          in Value returnValue
          );
  void tciEnqueueRaiseConnected (
          in TriPortIdType sender,
          in TriComponentIdType receiver,
          in TriSignatureIdType signature,
          in Value except
          );
  TriComponentIdType tciCreateTestComponent (
          in TciTestComponentKindType kind,
          in Type componentType,
          in TString name
          );
  void tciStartTestComponent (
          in TriComponentIdType comp,
          in TciBehaviourIdType behavior,
          in TciParameterListType parameterList
          );
  void tciStopTestComponent (
          in TriComponentIdType comp
          );
  void tciConnect (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciDisconnect (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciTestComponentTerminated (
         in TriComponentIdType comp,
         in VerdictValue verdict
         );
  TBoolean tciTestComponentRunning (
         in TriComponentIdType comp
         );
  TriComponentIdType tciGetMTC ();
  void tciMap (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciUnmap (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciExecuteTestCase (
         in TciTestCaseIdType testCaseId,
         in TriPortIdListType tsiPortList
         );
  TBoolean tciTestComponentDone (
         in TriComponentIdType comp
         );
  void tciReset ();
};

// ********************************************************************************
// Component Handling Interface
// -  Provided
// ********************************************************************************

interface TCI_CH_Provided {
  void tciSendConnected (
          in TriPortIdType sender,
          in TriComponentIdType receiver,
          in Value sendMessage
          );
  void tciSendConnectedBC (
         in TriPortIdType sender,
         in Value sendMessage
         );
  void tciSendConnectedMC (
         in TriPortIdType sender,
         in TriComponentIdListType receivers,
         in Value sendMessage
         );
```

```
void tciCallConnected (
        in TriPortIdType sender,
        in TriComponentIdType receiver,
        in TriSignatureIdType signature,
        in TciParameterListType parameterList
        );
void tciCallConnectedBC (
      in TriPortIdType sender,
      in TriSignatureIdType signature,
      in TciParameterListType parameterList
      );
void tciCallConnectedMC (
      in TriPortIdType sender,
      in TriComponentIdListType receivers,
      in TriSignatureIdType signature,
      in TciParameterListType parameterList
      );

void tciReplyConnected (
        in TriPortIdType sender,
        in TriComponentIdType receiver,
        in TriSignatureIdType signature,
        in TciParameterListType parameterList,
        in Value returnValue
        );
void tciReplyConnectedBC (
       in TriPortIdType sender,
       in TriSignatureIdType signature,
       in TciParameterListType parameterList,
       in Value returnValue
       );
void tciReplyConnectedMC (
       in TriPortIdType sender,
       in TriComponentIdListType receivers,
       in TriSignatureIdType signature,
       in TciParameterListType parameterList,
       in Value returnValue
       );

void tciRaiseConnected (
        in TriPortIdType      sender,
        in TriComponentIdType receiver,
        in TriSignatureIdType signature,
        in Value except
        );
void tciRaiseConnectedBC (
      in TriPortIdType sender,
      in TriSignatureIdType signature,
      in Value except
      );
void tciRaiseConnectedMC (
      in TriPortIdType sender,
      in TriComponentIdListType receivers,
      in TriSignatureIdType signature,
      in Value except
      );

TriComponentIdType tciCreateTestComponentReq (
        in TciTestComponentKindType kind,
        in Type componentType,
        in TString name
        );
void tciStartTestComponentReq (
        in TriComponentIdType comp,
        in TciBehaviourIdType behavior,
        in TciParameterListType parameterList
        );
void tciStopTestComponentReq (
        in TriComponentIdType comp
        );
void tciConnectReq (
        in TriPortIdType fromPort,
        in TriPortIdType toPort
        );
void tciDisconnectReq (
        in TriPortIdType fromPort,
        in TriPortIdType toPort
        );
```

```
  void tciTestComponentTerminatedReq (
          in TriComponentIdType comp,
          in VerdictValue verdict
          );
  TBoolean tciTestComponentRunningReq (
          in TriComponentIdType comp
          );
  TriComponentIdType tciGetMTCReq ();
  void tciMapReq (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciUnmapReq (
         in TriPortIdType fromPort,
         in TriPortIdType toPort
         );
  void tciExecuteTestCaseReq (
          in TciTestCaseIdType testCaseId,
          in TriPortIdListType tsiPortList
          );
  void tciResetReq ();
  TBoolean tciTestComponentDoneReq (
          in TriComponentIdType comp
          );
};

// *****************************************************************************
// Test Logging Interface
// -  Provided
// *****************************************************************************

interface TCI_TL_Provided {
  void tliTcExecute(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciTestCaseIdType tcId,
         in TciParameterListType tciPars, in TriTimerDurationType dur
         );
  void tliTcStart(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciTestCaseIdType tcId,
         in TciParameterListType tciPars, in TriTimerDurationType dur
         );
  void tliTcStop(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c
         );
  void tliTcStarted(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciTestCaseIdType tcId,
         in TciParameterListType tciPars, in TriTimerDurationType dur
         );
  void tliTcTerminated(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciTestCaseIdType tcId,
         in TciParameterListType tciPars, in VerdictValue verdict);

  void tliCtrlStart(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c
         );
  void tliCtrlStop(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c
         );
  void tliCtrlTerminated(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c);

  void tliMSend_m(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue,
         in Value addrValue, in TciStatusType encoderFailure,
         in TriMessageType msg, in TriAddressType address, in TriStatusType transmissionFailure
         );
   void tliMSend_m_BC(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue,
         in TciStatusType encoderFailure, in TriMessageType msg,
```

```
            in TriStatusType transmissionFailure
            );
      void tliMSend_m_MC(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue,
            in TciValueList addrValues, in TciStatusType encoderFailure,
            in TriMessageType msg, in TriAddressListType addresses,
            in TriStatusType transmissionFailure
            );

     void tliMSend_c(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to, in Value msgValue,
            in TriStatusType transmissionFailure
            );
      void tliMSend_c_BC(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in Value msgValue,
            in TriStatusType transmissionFailure
            );
      void tliMSend_c_MC(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to, in Value msgValue,
            in TriStatusType transmissionFailure);

     void tliMDetected_m(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in TriMessageType
msg,
            in TriAddressType address
            );
     void tliMDetected_c(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from, in Value msgValue
            );
     void tliMMismatch_m(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in Value msgValue,
            in TciValueTemplate msgTmpl, in TciValueDifferenceList diffs,
            in Value addrValue, in TciValueTemplate addressTmpl
            );
     void tliMMismatch_c(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in Value msgValue,
            in TciValueTemplate msgTmpl, in TciValueDifferenceList diffs,
            in TriComponentIdType from, in TciNonValueTemplate fromTmpl
            );
     void tliMReceive_m(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in Value msgValue,
            in TciValueTemplate msgTmpl, in Value addrValue,
            in TciValueTemplate addressTmpl
            );
     void tliMReceive_c(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in Value msgValue,
            in TciValueTemplate msgTmpl, in TriComponentIdType from,
            in TciNonValueTemplate fromTmpl
            );

     void tliPrCall_m(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
            in TriSignatureIdType signature, in TciParameterListType tciPars,
            in Value addrValue, in TciStatusType encoderFailure,
            in TriParameterListType triPars, in TriAddressType address,
            in TriStatusType transmissionFailure
            );
      void tliPrCall_m_BC(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
            in TriSignatureIdType signature, in TciParameterListType tciPars,
            in TciStatusType encoderFailure, in TriParameterListType triPars,
            in TriStatusType transmissionFailure
            );
      void tliPrCall_m_MC(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
```

```
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TciValueList addrValues, in TciStatusType encoderFailure,
       in TriParameterListType triPars, in TriAddressListType addresses,
       in TriStatusType transmissionFailure
       );

void tliPrCall_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TriStatusType transmissionFailure
       );
 void tliPrCall_c_BC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TriStatusType transmissionFailure
       );
    void tliPrCall_c_MC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TriStatusType transmissionFailure
       );

void tliPrGetCallDetected_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature, in TriParameterListType triPars,
       in TriAddressType address
       );
void tliPrGetCallDetected_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature, in TciParameterListType tciPars
       );
void tliPrGetCallMismatch_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TciValueTemplate parsTmpl, in TciValueDifferenceList diffs,
       in Value addrValue, in TciValueTemplate addressTmpl
       );
void tliPrGetCallMismatch_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TciValueTemplate parsTmpl, in TciValueDifferenceList diffs,
       in TriComponentIdType from, in TciNonValueTemplate fromTmpl
       );
void tliPrGetCall_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TciValueTemplate parsTmpl, in Value addrValue,
       in TciValueTemplate addressTmpl
       );
void tliPrGetCall_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in TciValueTemplate parsTmpl, in TriComponentIdType from,
       in TciNonValueTemplate fromTmpl
       );

void tliPrReply_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value replValue, in Value addrValue,
       in TciStatusType encoderFailure, in TriParameterListType triPars,
       in TriParameterType repl, in TriAddressType address, in TriStatusType transmissionFailure
       );
```

```
 void tliPrReply_m_BC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue,
       in TciStatusType encoderFailure, in TriParameterListType triPars,
       in TriParameterType repl, in TriStatusType transmissionFailure
       );
 void tliPrReply_m_MC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars, in Value replValue,
       in TciValueListType addrValues, in TciStatusType encoderFailure,
       in TriParameterListType triPars, in TriParameterType repl,
       in TriAddressListType addresses, in TriStatusType transmissionFailure
       );

void tliPrReply_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value replValue, in TriStatusType transmissionFailure
       );
 void tliPrReply_c_BC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in Value parsValue, in Value replValue,
       in TriStatusType transmissionFailure
       );
 void tliPrReply_c_MC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in Value parsValue, in Value replValue,
       in TriStatusType transmissionFailure
       );

void tliPrGetReplyDetected_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature, in TriParameterListType triPars,
       in TriParameterType repl, in TriAddressType address
       );
void tliPrGetReplyDetected_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value replValue
       );
void tliPrGetReplyMismatch_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in TciParameterListType tciPars, in TciValueTemplate parsTmpl,
       in Value replValue, in TciValueTemplate replyTmpl,
       in TciValueDifferenceList diffs, in Value addrValue,
       in TciValueTemplate addressTmpl
       );
void tliPrGetReplyMismatch_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in TciParameterListType tciPars, in TciValueTemplate parsTmpl,
       in Value replValue, in TciValueTemplate replyTmpl,
       in TciValueDifferenceList diffs, in TriComponentIdType from,
       in TciNonValueTemplate fromTmpl
       );
void tliPrGetReply_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in TciParameterListType tciPars, in TciValueTemplate parsTmpl,
       in Value replValue, in TciValueTemplate replyTmpl,
       in Value addrValue, in TciValueTemplate addressTmpl
       );
```

```
void tliPrGetReply_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in TciParameterListType tciPars, in TciValueTemplate parsTmpl,
       in Value replValue, in TciValueTemplate replyTmpl,
       in TriComponentIdType from, in TciNonValueTemplate fromTmpl
       );

void tliPrRaise_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in Value addrValue, in TciStatusType encoderFailure,
       in TriExceptionType exc, in TriAddressType address, in TriStatusType transmissionFailure
       );
 void tliPrRaise_m_BC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in TciStatusType encoderFailure, in TriExceptionType exc,
       in TriStatusType transmissionFailure
       );
 void tliPrRaise_m_MC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in TciValueListType addrValues,
       in TciStatusType encoderFailure, in TriExceptionType exc,
       in TriAddressListType addresses, in TriStatusType transmissionFailure
       );

void tliPrRaise_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in TriStatusType transmissionFailure
       );
 void tliPrRaise_c_BC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in TriStatusType transmissionFailure
       );
 void tliPrRaise_c_MC(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdListType to,
       in TriSignatureIdType signature, in TciParameterListType tciPars,
       in Value excValue, in TriStatusType transmissionFailure
       );

void tliPrCatchDetected_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature,
       in TriExceptionType exc, in TriAddressType address
       );
void tliPrCatchDetected_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at, in TriPortIdType from,
       in TriSignatureIdType signature, in Value excValue
       );
void tliPrCatchMismatch_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in Value excValue, in TciValueTemplate excTmpl,
       in TciValueDifferenceList diffs, in Value addrValue,
       in TciValueTemplate addressTmpl
       );
void tliPrCatchMismatch_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in Value excValue, in TciValueTemplate excTmpl,
       in TciValueDifferenceList diffs, in TriComponentIdType from,
       in TciNonValueTemplate fromTmpl
       );
```

```
void tliPrCatch_m(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in Value excValue, in TciValueTemplate excTmpl,
       in Value addrValue, in TciValueTemplate addressTmpl);

void tliPrCatch_c(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature,
       in Value excValue, in TciValueTemplate excTmpl,
       in TriComponentIdType from, in TciNonValueTemplate fromTmpl
       );
void tliPrCatchTimeoutDetected(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature
       );
void tliPrCatchTimeout(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType at,
       in TriSignatureIdType signature
       );
void tliCCreate(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriComponentIdType comp,
       in TString name, in TBoolean alive
       );
void tliCStart(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriComponentIdType comp,
       in TciBehaviourIdType name, in TciParameterListType tciPars
       );
void tliCRunning(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriComponentIdType comp, in ComponentStatusType status
       );
 void tliCAlive(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c,
         in TriComponentIdType comp, in ComponentStatusType status
         );
 void tliCStop(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriComponentIdType comp
         );
 void tliCKill(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriComponentIdType comp
         );
 void tliCDoneMismatch(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriComponentIdType comp, in TciNonValueTemplate compTmpl
         );
 void tliCKilledMismatch(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TriComponentIdType comp, in TciNonValueTemplate compTmpl
         );
 void tliCDone(in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciNonValueTemplate compTmpl
         );
 void tliCKilled(
         in TString am, in TInteger ts, in TString src, in TInteger line,
         in TriComponentIdType c, in TciNonValueTemplate compTmpl
         );
void tliCTerminated(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in VerdictValue verdict
       );
void tliPConnect(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2
       );
void tliPDisconnect(
       in TString am, in TInteger ts, in TString src, in TInteger line,
       in TriComponentIdType c, in TriPortIdType port1,
       in TriPortIdType port2
```

```
        );
void tliPMap(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port1, in TriPortIdType port2
        );
void tliPUnmap(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port1,
        in TriPortIdType port2
        );
void tliPClear(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port
        );
void tliPStart(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port
        );
void tliPStop(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port
        );
void tliPHalt(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriPortIdType port
        );
void tliEncode(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in Value val, in TciStatusType encoderFailure,
        in TriMessageType msg, in TString codec
        );
void tliDecode(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriMessageType msg,
        in TciStatusType decoderFailure, in Value val, in TString codec
        );
void tliTTimeoutDetected(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer
        );
void tliTTimeoutMismatch(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer, in TciNonValueTemplate timerTmpl
        );
void tliTTimeout(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer, in TciNonValueTemplate timerTmpl
        );
void tliTStart(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer,
        in TriTimerDurationType dur
        );
void tliTStop(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer, in TriTimerDurationType dur
        );
void tliTRead(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer,
        in TriTimerDurationType elapsed
        );
void tliTRunning(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in TriTimerIdType timer, in TimerStatusType status
        );
void tliSEnter(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars,
        in TString kind
        );
void tliSLeave(
        in TString am, in TInteger ts, in TString src, in TInteger line,
        in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars,
        in Value returnValue, in TString kind
        );
void tliVar(
        in TString am, in TInteger ts, in TString src, in TInteger line,
```

```
            in TriComponentIdType c, in QualifiedName name, in Value varValue
            );
        void tliModulePar(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in QualifiedName name, in Value parValue
            );
        void tliGetVerdict(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in VerdictValue verdict
            );
        void tliSetVerdict(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in VerdictValue verdict, in TString reason
            );
        void tliLog(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TString log
            );
        void tliAEnter(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliALeave(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliADefaults(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliAActivate(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in QualifiedName name, in TciParameterListType tciPars,
            in Value ref
            );
        void tliADeactivate(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in Value ref
            );
        void tliANomatch(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliARepeat(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliAWait(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c
            );
        void tliAction(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in TString action
          );
        void tliMatch(
            in TString am, in TInteger ts, in TString src, in TInteger line,
            in TriComponentIdType c, in Value expr, in TciValueTemplate tmpl
          );
        void tliMatchMismatch(
            in TString am, in TInteger ts, in TString src,
            in TInteger line, in TriComponentIdType c, in Value expr,
            in TciValueTemplate tmpl, in TciValueDifferenceList diffs
            );
        void tliInfo(
            in TString am, in TInteger ts, in TString src,
            in TInteger line, in TriComponentIdType c,
            in TInteger level, in TString info
            );
    };
};
```

Annex B (normative): XML Mapping for TCI TL Provided

This annex defines a mapping for the logging interface of TCI using eXtended Markup Language (XML) schema definitions.

B.1 TCI-TL XML Schema for Simple Types

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            targetNamespace="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
            xmlns:SimpleTypes="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
            elementFormDefault="qualified">

    <!-- Basic definitions -->
    <xsd:simpleType name="xpath">
        <!-- this string should be XPATH complient -->
        <xsd:restriction base="xsd:string"/>
    </xsd:simpleType>

    <xsd:simpleType name="TBoolean">
        <xsd:restriction base="xsd:boolean"/>
    </xsd:simpleType>

    <xsd:simpleType name="TString">
        <xsd:restriction base="xsd:string"/>
    </xsd:simpleType>

    <xsd:simpleType name="TInteger">
        <xsd:restriction base="xsd:integer"/>
    </xsd:simpleType>

    <!-- Miscellaneous -->
    <xsd:simpleType name="TriTimerDurationType">
        <xsd:restriction base="xsd:float"/>
    </xsd:simpleType>

    <xsd:simpleType name="TciParameterPassingModeType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="in"/>
            <xsd:enumeration value="inout"/>
            <xsd:enumeration value="out"/>
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:simpleType name="TriStatusType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="TRI_Ok"/>
            <xsd:enumeration value="TRI_Error"/>
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:simpleType name="TciStatusType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="TCI_Ok"/>
            <xsd:enumeration value="TCI_Error"/>
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:simpleType name="ComponentStatusType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="inactiveC"/>
            <xsd:enumeration value="runningC"/>
            <xsd:enumeration value="stoppedC"/>
            <xsd:enumeration value="killedC"/>
        </xsd:restriction>
    </xsd:simpleType>
```

```
    <xsd:simpleType name="TimerStatusType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="runningT"/>
            <xsd:enumeration value="inactiveT"/>
            <xsd:enumeration value="expiredT"/>
        </xsd:restriction>
    </xsd:simpleType>

    <xsd:simpleType name="PortStatusType">
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="startedP"/>
            <xsd:enumeration value="haltedP"/>
            <xsd:enumeration value="stoppedP"/>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:schema>
```

B.2 TCI-TL XML Schema for Types

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
    xmlns:Types="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
    xmlns:SimpleTypes="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
    xmlns:Values="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    xmlns:Templates="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
        elementFormDefault="qualified">

    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
     schemaLocation="Values_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
     schemaLocation="SimpleTypes_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
     schemaLocation="Templates_v3_3_1.xsd"/>

    <!-- Connection -->
    <xsd:complexType name="TriPortIdType">
        <xsd:sequence>
            <xsd:element name="comp" type="Types:TriComponentIdType" />
            <xsd:element name="port" type="Types:Port" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="TriPortIdListType">
        <xsd:sequence>
            <xsd:element name="comp" type="Types:TriPortIdType" minOccurs="0"
             maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="Port">
        <xsd:sequence>
            <xsd:element name="id" type="Types:Id"  />
            <xsd:element name="index" type="xsd:int" minOccurs="0" />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="TriComponentIdType">
        <xsd:sequence>
            <xsd:choice>
                <xsd:element name="null" type="Templates:null"/>
                <xsd:element name="id" type="Types:Id"  />
            </xsd:choice>
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="TriComponentIdListType">
        <xsd:sequence>
            <xsd:element name="comp" type="Types:TriComponentIdType" minOccurs="0"
             maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>
```

```
    <!-- Communication -->
    <xsd:complexType name="TriMessageType">
        <xsd:attribute name="val" type="xsd:hexBinary"/>
    </xsd:complexType>

    <xsd:complexType name="TriParameterType">
        <xsd:sequence>
            <xsd:element name="val" type="xsd:hexBinary"  />
        </xsd:sequence>
        <xsd:attribute name="name" type="SimpleTypes:TString"/>
        <xsd:attribute name="mode" type="SimpleTypes:TciParameterPassingModeType"/>
    </xsd:complexType>

    <xsd:complexType name="TriParameterListType">
        <xsd:sequence>
            <xsd:element name="par" type="Types:TriParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="TriExceptionType">
        <xsd:attribute name="val" type="SimpleTypes:TString"/>
    </xsd:complexType>

    <xsd:complexType name="TciValueList">
        <xsd:complexContent>
            <xsd:extension base="Values:RecordValue"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="TriSignatureIdType">
        <xsd:attribute name="val" type="SimpleTypes:TString" use="required"/>
    </xsd:complexType>

    <xsd:complexType name="TriAddressType">
        <xsd:attribute name="val" type="SimpleTypes:TString"/>
    </xsd:complexType>

    <xsd:complexType name="TriAddressListType">
        <xsd:sequence>
            <xsd:element name="addr" type="Types:TriAddressType" minOccurs="0"
             maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>


    <!-- Miscellaneous -->
    <xsd:complexType name="TriTimerIdType">
        <xsd:sequence>
            <xsd:element name="id" type="Types:Id"  />
        </xsd:sequence>
    </xsd:complexType>

    <!-- Basic definitions -->
    <xsd:complexType name="QualifiedName">
        <xsd:attribute name="moduleName" type="SimpleTypes:TString" use="required"/>
        <xsd:attribute name="baseName" type="SimpleTypes:TString" use="required"/>
    </xsd:complexType>

    <!-- general TCI abstract data types -->
    <xsd:complexType name="TciBehaviourIdType">
        <xsd:sequence>
            <xsd:element name="name" type="Types:QualifiedName"  />
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="TciTestCaseIdType">
        <xsd:sequence>
            <xsd:element name="name" type="Types:QualifiedName"  />
        </xsd:sequence>
    </xsd:complexType>
```

```
    <xsd:complexType name="TciParameterType">
        <xsd:sequence>
            <xsd:element name="val" type="Values:Value"  />
        </xsd:sequence>
        <xsd:attribute name="name" type="SimpleTypes:TString"/>
        <xsd:attribute name="mode" type="SimpleTypes:TciParameterPassingModeType"/>
    </xsd:complexType>

    <xsd:complexType name="TciParameterListType">
        <xsd:sequence>
            <xsd:element name="par" type="Types:TciParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xsd:sequence>
    </xsd:complexType>

    <!-- general identifier structure for test components, ports and timer -->
    <xsd:complexType name="Id">
        <xsd:sequence>
           <xsd:element name="name" type="SimpleTypes:TString" />
           <xsd:element name="id" type="SimpleTypes:TString" minOccurs="0"/>
           <xsd:element name="type" type="SimpleTypes:TString" minOccurs="0"/>
        </xsd:sequence>
    </xsd:complexType>

</xsd:schema>
```

B.3 TCI-TL XML Schema for Values

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    xmlns:Values="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    xmlns:Templates="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
    xmlns:SimpleTypes="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
elementFormDefault="qualified">

    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
     schemaLocation="Templates_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
     schemaLocation="SimpleTypes_v3_3_1.xsd"/>

    <xsd:attributeGroup name="ValueAtts">
        <xsd:attribute name="name" type="SimpleTypes:TString" use="optional"/>
        <xsd:attribute name="type" type="SimpleTypes:TString" use="optional"/>
        <xsd:attribute name="module" type="SimpleTypes:TString" use="optional"/>
        <xsd:attribute name="annotation" type="SimpleTypes:TString" use="optional"/>
    </xsd:attributeGroup>

    <xsd:complexType name="Value" mixed="true">
        <xsd:choice>
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:CharstringValue"/>
            <xsd:element name="universal_charstring" type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
```

```
<!-- general event elements -->
<xsd:complexType name="IntegerValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="FloatValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="BooleanValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="VerdictValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="BitstringValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="HexstringValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="OctetstringValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="CharstringValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="UniversalCharstringValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
```

```
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="RecordValue">
    <xsd:choice>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:CharstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
        </xsd:choice>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="RecordOfValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="charstring" type="Values:CharstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="universal_charstring"
            type="Values:UniversalCharstringValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="array" type="Values:ArrayValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="set" type="Values:SetValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="set_of" type="Values:SetOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

```
<xsd:complexType name="ArrayValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="charstring" type="Values:CharstringValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="universal_charstring"
            type="Values:UniversalCharstringValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="array" type="Values:ArrayValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="set" type="Values:SetValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="set_of" type="Values:SetOfValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"
            minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
            maxOccurs="unbounded"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="SetValue">
    <xsd:choice>
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:CharstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
        </xsd:choice>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="SetOfValue">
    <xsd:choice>
            <xsd:element name="integer" type="Values:IntegerValue" minOccurs="0"
```

```
                maxOccurs="unbounded"/>
            <xsd:element name="float" type="Values:FloatValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="boolean" type="Values:BooleanValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="charstring" type="Values:CharstringValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="record" type="Values:RecordValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="array" type="Values:ArrayValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="set" type="Values:SetValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="set_of" type="Values:SetOfValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="union" type="Values:UnionValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="anytype" type="Values:AnytypeValue" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="address" type="Values:AddressValue" minOccurs="0"
                maxOccurs="unbounded"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="EnumeratedValue">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="UnionValue">
    <xsd:choice>
        <xsd:element name="integer" type="Values:IntegerValue"/>
        <xsd:element name="float" type="Values:FloatValue"/>
        <xsd:element name="boolean" type="Values:BooleanValue"/>
        <xsd:element name="verdicttype" type="Values:VerdictValue"/>
        <xsd:element name="bitstring" type="Values:BitstringValue"/>
        <xsd:element name="hexstring" type="Values:HexstringValue"/>
        <xsd:element name="octetstring" type="Values:OctetstringValue"/>
        <xsd:element name="charstring" type="Values:CharstringValue"/>
        <xsd:element name="universal_charstring"
            type="Values:UniversalCharstringValue"/>
        <xsd:element name="record" type="Values:RecordValue"/>
        <xsd:element name="record_of" type="Values:RecordOfValue"/>
        <xsd:element name="array" type="Values:ArrayValue"/>
        <xsd:element name="set" type="Values:SetValue"/>
        <xsd:element name="set_of" type="Values:SetOfValue"/>
        <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
        <xsd:element name="union" type="Values:UnionValue"/>
        <xsd:element name="anytype" type="Values:AnytypeValue"/>
        <xsd:element name="address" type="Values:AddressValue"/>
        <xsd:element name="null" type="Templates:null"/>
        <xsd:element name="omit" type="Templates:omit"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>
```

```
    <xsd:complexType name="AnytypeValue">
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:OctetstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="address" type="Values:AddressValue"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>

    <xsd:complexType name="AddressValue">
        <xsd:choice minOccurs="0" maxOccurs="unbounded">
            <xsd:element name="integer" type="Values:IntegerValue"/>
            <xsd:element name="float" type="Values:FloatValue"/>
            <xsd:element name="boolean" type="Values:BooleanValue"/>
            <xsd:element name="verdicttype" type="Values:VerdictValue"/>
            <xsd:element name="bitstring" type="Values:BitstringValue"/>
            <xsd:element name="hexstring" type="Values:HexstringValue"/>
            <xsd:element name="octetstring" type="Values:OctetstringValue"/>
            <xsd:element name="charstring" type="Values:OctetstringValue"/>
            <xsd:element name="universal_charstring"
                type="Values:UniversalCharstringValue"/>
            <xsd:element name="record" type="Values:RecordValue"/>
            <xsd:element name="record_of" type="Values:RecordOfValue"/>
            <xsd:element name="array" type="Values:ArrayValue"/>
            <xsd:element name="set" type="Values:SetValue"/>
            <xsd:element name="set_of" type="Values:SetOfValue"/>
            <xsd:element name="enumerated" type="Values:EnumeratedValue"/>
            <xsd:element name="union" type="Values:UnionValue"/>
            <xsd:element name="anytype" type="Values:AnytypeValue"/>
            <xsd:element name="null" type="Templates:null"/>
            <xsd:element name="omit" type="Templates:omit"/>
        </xsd:choice>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>
</xsd:schema>
```

B.4 TCI-TL XML Schema for Templates

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
    xmlns:Templates="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
    xmlns:Values="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    xmlns:Types="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
    xmlns:SimpleTypes="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
elementFormDefault="qualified">

    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
     schemaLocation="Values_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
schemaLocation="Types_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
     schemaLocation="SimpleTypes_v3_3_1.xsd"/>

    <xsd:complexType name="TciValueTemplate">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Values:Value">
            <xsd:choice>
```

```
                <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                <xsd:element name="float" type="Templates:FloatTemplate"/>
                <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
                <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
                <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
                <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
                <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
                <xsd:element name="universal_charstring"
                        type="Templates:UniversalCharstringTemplate"/>
                <xsd:element name="record" type="Templates:RecordTemplate"/>
                <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
                <xsd:element name="array" type="Values:ArrayValue"/>
                <xsd:element name="set" type="Templates:SetTemplate"/>
                <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
                <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                <xsd:element name="union" type="Templates:UnionTemplate"/>
                <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
                <xsd:element name="address" type="Templates:AddressTemplate"/>
                <xsd:element name="omit" type="Templates:omit"/>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
            </xsd:choice>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="omit">
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>

    <xsd:complexType name="any">
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>

    <xsd:complexType name="anyoromit">
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>


    <xsd:complexType name="TciNonValueTemplate">
        <xsd:sequence>
            <xsd:choice>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="all" type="Templates:all"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                <xsd:element name="null" type="Templates:null"/>
            </xsd:choice>
        </xsd:sequence>
    </xsd:complexType>

    <xsd:complexType name="all">
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>

    <xsd:complexType name="null">
        <xsd:attributeGroup ref="Values:ValueAtts"/>
    </xsd:complexType>

    <xsd:complexType name="TciValueDifference">
        <xsd:sequence>
            <xsd:element name="val" type="SimpleTypes:xpath"/>
            <xsd:element name="tmpl" type="SimpleTypes:xpath"/>
        </xsd:sequence>
        <xsd:attributeGroup ref="Values:ValueAtts"/>
        <xsd:attribute name="desc" type="SimpleTypes:TString" use="optional"/>
    </xsd:complexType>

    <xsd:complexType name="TciValueDifferenceList">
            <xsd:sequence>
                    <xsd:element name="diff" type="Templates:TciValueDifference"
maxOccurs="unbounded"/>
            </xsd:sequence>
        </xsd:complexType>

    <xsd:complexType name="IntegerTemplate">
        <xsd:choice>
```

```
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="FloatTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="BooleanTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="BitstringTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="HexstringTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="OctetstringTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="CharstringTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
```

```
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="UniversalCharstringTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
    </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="VerdictTemplate">
    <xsd:choice>
        <xsd:element name="value" type="SimpleTypes:TString"/>
            <xsd:element name="templateDef" type="SimpleTypes:TString"/>
            <xsd:element name="omit" type="Templates:omit"/>
            <xsd:element name="any" type="Templates:any"/>
            <xsd:element name="anyoromit" type="Templates:anyoromit"/>
            <xsd:element name="null" type="Templates:null"/>
        </xsd:choice>
    <xsd:attributeGroup ref="Values:ValueAtts"/>
</xsd:complexType>

<xsd:complexType name="RecordTemplate">
    <xsd:complexContent>
        <xsd:extension base="Values:RecordValue">
            <xsd:choice>
                <xsd:choice minOccurs="0">
                    <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                    <xsd:element name="float" type="Templates:FloatTemplate"/>
                    <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                    <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
                    <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
                    <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
                    <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
                    <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
                    <xsd:element name="universal_charstring"
                        type="Templates:UniversalCharstringTemplate"/>
                    <xsd:element name="record" type="Templates:RecordTemplate"/>
                    <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
                    <xsd:element name="array" type="Values:ArrayValue"/>
                    <xsd:element name="set" type="Templates:SetTemplate"/>
                    <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
                    <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                    <xsd:element name="union" type="Templates:UnionTemplate"/>
                    <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
                    <xsd:element name="address" type="Templates:AddressTemplate"/>
                </xsd:choice>
                <xsd:element name="omit" type="Templates:omit"/>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                <xsd:element name="null" type="Templates:null"/>
            </xsd:choice>
    </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="RecordOfTemplate">
    <xsd:complexContent>
        <xsd:extension base="Values:RecordOfValue">
            <xsd:choice minOccurs="0" maxOccurs="unbounded">
                <xsd:element name="integer" type="Templates:IntegerTemplate" minOccurs="0"
                        maxOccurs="unbounded"/>
                <xsd:element name="float" type="Templates:FloatTemplate" minOccurs="0"
                        maxOccurs="unbounded"/>
                <xsd:element name="boolean" type="Templates:BooleanTemplate" minOccurs="0"
                        maxOccurs="unbounded"/>
                <xsd:element name="verdicttype" type="Templates:VerdictTemplate" minOccurs="0"
                        maxOccurs="unbounded"/>
                <xsd:element name="bitstring" type="Templates:BitstringTemplate"
                        minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="hexstring" type="Templates:HexstringTemplate"
```

```
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="octetstring" type="Templates:OctetstringTemplate"
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="charstring" type="Templates:CharstringTemplate"
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="universal_charstring"
                    type="Templates:UniversalCharstringTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="record" type="Templates:RecordTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="record_of" type="Templates:RecordOfTemplate"
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="array" type="Templates:ArrayTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="set" type="Templates:SetTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="set_of" type="Templates:SetOfTemplate"
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"
                    minOccurs="0" maxOccurs="unbounded"/>
                <xsd:element name="union" type="Templates:UnionTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="anytype" type="Templates:AnytypeTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="address" type="Templates:AddressTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="omit" type="Templates:omit"/>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                <xsd:element name="null" type="Templates:null"/>
            </xsd:choice>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="SetTemplate">
    <xsd:complexContent>
        <xsd:extension base="Values:SetValue">
            <xsd:choice>
                <xsd:choice minOccurs="0">
                    <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                    <xsd:element name="float" type="Templates:FloatTemplate"/>
                    <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                    <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
                    <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
                    <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
                    <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
                    <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
                    <xsd:element name="universal_charstring"
                        type="Templates:UniversalCharstringTemplate"/>
                    <xsd:element name="record" type="Templates:RecordTemplate"/>
                    <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
                    <xsd:element name="array" type="Templates:ArrayTemplate"/>
                    <xsd:element name="set" type="Templates:SetTemplate"/>
                    <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
                    <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                    <xsd:element name="union" type="Templates:UnionTemplate"/>
                    <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
                    <xsd:element name="address" type="Templates:AddressTemplate"/>
                </xsd:choice>
                <xsd:element name="omit" type="Templates:omit"/>
                <xsd:element name="any" type="Templates:any"/>
                <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                <xsd:element name="null" type="Templates:null"/>
            </xsd:choice>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="SetOfTemplate">
    <xsd:complexContent>
        <xsd:extension base="Values:SetOfValue">
            <xsd:choice minOccurs="0" maxOccurs="unbounded">
                <xsd:element name="integer" type="Templates:IntegerTemplate" minOccurs="0"
                    maxOccurs="unbounded"/>
                <xsd:element name="float" type="Templates:FloatTemplate" minOccurs="0"
```

```
                maxOccurs="unbounded"/>
            <xsd:element name="boolean" type="Templates:BooleanTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="verdicttype" type="Templates:VerdictTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="bitstring" type="Templates:BitstringTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="hexstring" type="Templates:HexstringTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="octetstring" type="Templates:OctetstringTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="charstring" type="Templates:CharstringTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="universal_charstring"
                type="Templates:UniversalCharstringTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="record" type="Templates:RecordTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="record_of" type="Templates:RecordOfTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="array" type="Templates:ArrayTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="set" type="Templates:SetTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="set_of" type="Templates:SetOfTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"
                minOccurs="0" maxOccurs="unbounded"/>
            <xsd:element name="union" type="Templates:UnionTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="anytype" type="Templates:AnytypeTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="address" type="Templates:AddressTemplate" minOccurs="0"
                maxOccurs="unbounded"/>
            <xsd:element name="omit" type="Templates:omit"/>
            <xsd:element name="any" type="Templates:any"/>
            <xsd:element name="anyoromit" type="Templates:anyoromit"/>
            <xsd:element name="templateDef" type="SimpleTypes:TString"/>
            <xsd:element name="null" type="Templates:null"/>
        </xsd:choice>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="EnumeratedTemplate">
  <xsd:complexContent>
    <xsd:extension base="Values:EnumeratedValue">
      <xsd:choice minOccurs="0">
        <xsd:element name="value" type="SimpleTypes:TString"/>
        <xsd:element name="templateDef" type="SimpleTypes:TString"/>
        <xsd:element name="omit" type="Templates:omit"/>
        <xsd:element name="any" type="Templates:any"/>
        <xsd:element name="anyoromit" type="Templates:anyoromit"/>
        <xsd:element name="null" type="Templates:null"/>
      </xsd:choice>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="UnionTemplate">
  <xsd:complexContent>
    <xsd:extension base="Values:UnionValue">
      <xsd:choice minOccurs="0">
        <xsd:element name="integer" type="Templates:IntegerTemplate"/>
        <xsd:element name="float" type="Templates:FloatTemplate"/>
        <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
        <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
        <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
        <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
        <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
        <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
        <xsd:element name="universal_charstring"
            type="Templates:UniversalCharstringTemplate"/>
        <xsd:element name="record" type="Templates:RecordTemplate"/>
        <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
        <xsd:element name="array" type="Templates:ArrayTemplate"/>
        <xsd:element name="set" type="Templates:SetTemplate"/>
        <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
```

```
                    <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                    <xsd:element name="union" type="Templates:UnionTemplate"/>
                    <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
                    <xsd:element name="address" type="Templates:AddressTemplate"/>
                    <xsd:element name="omit" type="Templates:omit"/>
                    <xsd:element name="any" type="Templates:any"/>
                    <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                    <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                    <xsd:element name="null" type="Templates:null"/>
                </xsd:choice>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="AnytypeTemplate">
        <xsd:complexContent>
            <xsd:extension base="Values:AnytypeValue">
                <xsd:choice minOccurs="0">
                    <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                    <xsd:element name="float" type="Templates:FloatTemplate"/>
                    <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                    <xsd:element name="verdicttype" type="Templates:VerdictTemplate"/>
                    <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
                    <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
                    <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
                    <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
                    <xsd:element name="universal_charstring"
                        type="Templates:UniversalCharstringTemplate"/>
                    <xsd:element name="record" type="Templates:RecordTemplate"/>
                    <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
                    <xsd:element name="array" type="Templates:ArrayTemplate"/>
                    <xsd:element name="set" type="Templates:SetTemplate"/>
                    <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
                    <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                    <xsd:element name="union" type="Templates:UnionTemplate"/>
                    <xsd:element name="address" type="Templates:AddressTemplate"/>
                    <xsd:element name="omit" type="Templates:omit"/>
                    <xsd:element name="any" type="Templates:any"/>
                    <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                    <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                    <xsd:element name="null" type="Templates:null"/>
                </xsd:choice>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="AddressTemplate">
        <xsd:complexContent>
            <xsd:extension base="Values:AnytypeValue">
                <xsd:choice minOccurs="0">
                    <xsd:element name="integer" type="Templates:IntegerTemplate"/>
                    <xsd:element name="float" type="Templates:FloatTemplate"/>
                    <xsd:element name="boolean" type="Templates:BooleanTemplate"/>
                    <xsd:element name="bitstring" type="Templates:BitstringTemplate"/>
                    <xsd:element name="hexstring" type="Templates:HexstringTemplate"/>
                    <xsd:element name="octetstring" type="Templates:OctetstringTemplate"/>
                    <xsd:element name="charstring" type="Templates:CharstringTemplate"/>
                    <xsd:element name="universal_charstring"
                        type="Templates:UniversalCharstringTemplate"/>
                    <xsd:element name="record" type="Templates:RecordTemplate"/>
                    <xsd:element name="record_of" type="Templates:RecordOfTemplate"/>
                    <xsd:element name="array" type="Templates:ArrayTemplate"/>
                    <xsd:element name="set" type="Templates:SetTemplate"/>
                    <xsd:element name="set_of" type="Templates:SetOfTemplate"/>
                    <xsd:element name="enumerated" type="Templates:EnumeratedTemplate"/>
                    <xsd:element name="union" type="Templates:UnionTemplate"/>
                    <xsd:element name="anytype" type="Templates:AnytypeTemplate"/>
                    <xsd:element name="omit" type="Templates:omit"/>
                    <xsd:element name="any" type="Templates:any"/>
                    <xsd:element name="anyoromit" type="Templates:anyoromit"/>
                    <xsd:element name="templateDef" type="SimpleTypes:TString"/>
                    <xsd:element name="null" type="Templates:null"/>
                </xsd:choice>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
</xsd:schema>
```

B.5 TCI-TL XML Schema for Events

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://uri.etsi.org/ttcn-3/tci/Events_v3_3_1.xsd"
    xmlns:Events="http://uri.etsi.org/ttcn-3/tci/Events_v3_3_1.xsd"
    xmlns:Types="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
    xmlns:Templates="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
    xmlns:SimpleTypes="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
    xmlns:Values="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    elementFormDefault="qualified">

    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/SimpleTypes_v3_3_1.xsd"
     schemaLocation="SimpleTypes_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
schemaLocation="Types_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
     schemaLocation="Values_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Templates_v3_3_1.xsd"
     schemaLocation="Templates_v3_3_1.xsd"/>

    <!-- common definition for all events -->
    <xsd:complexType name="Event" mixed="true">
        <xsd:sequence>
            <xsd:element name="am" type="SimpleTypes:TString"/>
        </xsd:sequence>
        <xsd:attribute name="ts" type="xsd:long" use="required"/>
        <xsd:attribute name="src" type="SimpleTypes:TString" use="optional"/>
        <xsd:attribute name="line" type="SimpleTypes:TInteger" use="optional"/>

        <!-- general identifier structure for test components, ports and timer -->
        <xsd:attribute name="name" type="SimpleTypes:TString" use="required"/>
        <xsd:attribute name="id" type="SimpleTypes:TString" use="required"/>
        <xsd:attribute name="type" type="SimpleTypes:TString" use="required"/>
    </xsd:complexType>

    <!-- this event is extended by all port configuration events -->
    <xsd:complexType name="PortConfiguration">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="port1" type="Types:TriPortIdType"  />
                    <xsd:element name="port2" type="Types:TriPortIdType"  />
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- this event is extended by all port status events -->
    <xsd:complexType name="PortStatus">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="port" type="Types:TriPortIdType"/>
                    <xsd:element name="stat" type="SimpleTypes:PortStatusType"  minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- testcases -->
    <xsd:complexType name="tliTcExecute">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTcStart">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
```

```
                    <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTcStop">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTcStarted">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTcTerminated">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="tcId" type="Types:TciTestCaseIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="verdict" type="Values:VerdictValue"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- control -->
    <xsd:complexType name="tliCtrlStart">
        <xsd:complexContent>
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliCtrlStop">
        <xsd:complexContent>
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliCtrlTerminated">
        <xsd:complexContent>
            <xsd:extension base="Events:Event"/>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- asynchronous communication -->
    <xsd:complexType name="tliMSend_m">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="addrValue " type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
```

```
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_m_BC">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_m_MC">
         <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="msg" type="Types:TriMessageType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMSend_c_MC">
        <xsd:complexContent mixed="true">
```

```
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Values:Value"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="msgValue" type="Types:TriMessageType"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"/>
                        <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                        <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"/>
                        <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                        <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                        <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliMReceive_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="msgValue" type="Values:Value" minOccurs="0"/>
                        <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                        <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
```

```
                        <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>

        <xsd:complexType name="tliMReceive_c">
            <xsd:complexContent mixed="true">
                <xsd:extension base="Events:Event">
                        <xsd:sequence>
                            <xsd:element name="at" type="Types:TriPortIdType"/>
                            <xsd:element name="msgValue" type="Values:Value" minOccurs="0"/>
                            <xsd:element name="msgTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                            <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                            <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                    </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>

         <!-- synchronous communication -->
        <xsd:complexType name="tliPrCall_m">
            <xsd:complexContent mixed="true">
                <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                        <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                        <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                        <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                        <xsd:choice>
                            <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                            <xsd:sequence>
                                <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                                <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                                <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                            </xsd:sequence>
                        </xsd:choice>
                    </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>

        <xsd:complexType name="tliPrCall_m_BC">
            <xsd:complexContent mixed="true">
                <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                        <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                        <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                        <xsd:choice>
                            <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                            <xsd:sequence>
                                <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                                <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                            </xsd:sequence>
                        </xsd:choice>
                    </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>

        <xsd:complexType name="tliPrCall_m_MC">
            <xsd:complexContent mixed="true">
                <xsd:extension base="Events:Event">
                    <xsd:sequence>
                        <xsd:element name="at" type="Types:TriPortIdType"/>
                        <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
```

```
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCall_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="triPars" type="Types:TriParameterListType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
```

```
    <xsd:complexType name="tliPrGetCallDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCallMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCall_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetCall_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
```

```
    <xsd:complexType name="tliPrReply_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
                                 type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_m_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
                                 type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_m_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
                             minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="triPars" type="Types:TriParameterListType"
minOccurs="0"/>
                            <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
                                 type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
```

```
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrReply_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="triPars" type="Types:TriParameterListType" minOccurs="0"/>
                    <xsd:element name="repl" type="Types:TriParameterType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
```

```
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReplyMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReply_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrGetReply_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="parsTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="replValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="replTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_m">
        <xsd:complexContent mixed="true">
```

```
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_m_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_m_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addrValues" type="Types:TciValueListType" minOccurs="0"/>
                    <xsd:choice>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:sequence>
                            <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                            <xsd:element name="addresses" type="Types:TriAddressListType"
minOccurs="0"/>
                            <xsd:element name="transmission-failure"
type="SimpleTypes:TriStatusType" minOccurs="0"/>
                        </xsd:sequence>
                    </xsd:choice>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdType" minOccurs="0"/>
```

```
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c_BC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrRaise_c_MC">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="to" type="Types:TriPortIdListType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="transmission-failure" type="SimpleTypes:TriStatusType"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchDetected_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="exc" type="Types:TriExceptionType" minOccurs="0"/>
                    <xsd:element name="address" type="Types:TriAddressType" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchDetected_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="from" type="Types:TriPortIdType" minOccurs="0"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchMismatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
```

```
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchMismatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatch_m">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate"/>
                    <xsd:element name="addrValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="addressTmpl" type="Templates:TciValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatch_c">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                    <xsd:element name="excValue" type="Values:Value" minOccurs="0"/>
                    <xsd:element name="excTmpl" type="Templates:TciValueTemplate" minOccurs="0"/>
                    <xsd:element name="from" type="Types:TriComponentIdType" minOccurs="0"/>
                    <xsd:element name="fromTmpl" type="Templates:TciNonValueTemplate"
minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchTimeoutDetected">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPrCatchTimeout">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="at" type="Types:TriPortIdType"/>
                    <xsd:element name="signature" type="Types:TriSignatureIdType"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>
```

```
<!-- components -->
<xsd:complexType name="tliCCreate">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="name" type="SimpleTypes:TString"/>
                <xsd:element name="alive" type="SimpleTypes:TBoolean"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCStart">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="name" type="Types:TciBehaviourIdType"/>
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCRunning">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="status" type="SimpleTypes:ComponentStatusType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>


<xsd:complexType name="tliCAlive">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="status" type="SimpleTypes:ComponentStatusType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCStop">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCKill">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCDoneMismatch">
   <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
```

```
</xsd:complexType>

<xsd:complexType name="tliCKilledMismatch">
   <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="comp" type="Types:TriComponentIdType"/>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCDone">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

 <xsd:complexType name="tliCKilled">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="compTmpl" type="Templates:TciNonValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliCTerminated">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue" />
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- ports -->
<xsd:complexType name="tliPConnect">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortConfiguration"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliPDisconnect">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortConfiguration"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliPMap">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortConfiguration"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliPUnmap">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortConfiguration"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliPClear">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortStatus"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliPStart">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:PortStatus"/>
    </xsd:complexContent>
```

```
    </xsd:complexType>

    <xsd:complexType name="tliPStop">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliPHalt">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:PortStatus"/>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- codec -->
    <xsd:complexType name="tliEncode">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="val" type="Values:Value"/>
                    <xsd:choice>
                        <xsd:element name="msg" type="Types:TriMessageType"/>
                        <xsd:element name="encoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                    </xsd:choice>
                    <xsd:element name="codec" type="SimpleTypes:TString"
                         minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliDecode" mixed="true">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="msg" type="Types:TriMessageType"/>
                    <xsd:choice>
                        <xsd:element name="decoder-failure" type="SimpleTypes:TciStatusType"
minOccurs="0"/>
                        <xsd:element name="val" type="Values:Value"/>
                    </xsd:choice>
                    <xsd:element name="codec" type="SimpleTypes:TString"
                         minOccurs="0"/>
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <!-- timers -->
    <xsd:complexType name="tliTTimeoutDetected">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="timer" type="Types:TriTimerIdType"  />
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTTimeoutMismatch">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="timer" type="Types:TriTimerIdType"  />
                    <xsd:element name="timerTmpl" type="Templates:TciNonValueTemplate"  />
                </xsd:sequence>
            </xsd:extension>
        </xsd:complexContent>
    </xsd:complexType>

    <xsd:complexType name="tliTTimeout">
        <xsd:complexContent mixed="true">
            <xsd:extension base="Events:Event">
                <xsd:sequence>
                    <xsd:element name="timer" type="Types:TriTimerIdType"  />
                    <xsd:element name="timerTmpl" type="Templates:TciNonValueTemplate"  />
                </xsd:sequence>
```

```
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTStart">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTStop">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="dur" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTRead">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
                <xsd:element name="elapsed" type="SimpleTypes:TriTimerDurationType"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliTRunning">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="timer" type="Types:TriTimerIdType"/>
            </xsd:sequence>
            <xsd:attribute name="status" type="SimpleTypes:TimerStatusType"/>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- scope -->
<xsd:complexType name="tliSEnter">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="kind" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliSLeave">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="returnValue" type="Values:Value" minOccurs="0"/>
                <xsd:element name="kind" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- variables and module parameter -->
<xsd:complexType name="tliVar">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
```

```
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="val" type="Values:Value" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliModulePar">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="val" type="Values:Value" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- verdicts -->
<xsd:complexType name="tliGetVerdict">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliSetVerdict">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="verdict" type="Values:VerdictValue"/>
                <xsd:element name="reason" type="SimpleTypes:TString" minOccurs="0"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- log -->
<xsd:complexType name="tliLog">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="log" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<!-- alt -->
<xsd:complexType name="tliAEnter">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliALeave">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliADefaults">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAActivate">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="name" type="Types:QualifiedName"  />
                <xsd:element name="tciPars" type="Types:TciParameterListType" minOccurs="0"/>
                <xsd:element name="ref" type="Values:Value"/>
```

```
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliADeactivate">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="ref" type="Values:Value"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliANomatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliARepeat">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAWait">
    <xsd:complexContent>
        <xsd:extension base="Events:Event"/>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliAction">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="action" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliMatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="expr" type="Values:Value"/>
                <xsd:element name="tmpl" type="Templates:TciValueTemplate"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliMatchMismatch">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="expr" type="Values:Value"/>
                <xsd:element name="tmpl" type="Templates:TciValueTemplate"/>
                <xsd:element name="diffs" type="Templates:TciValueDifferenceList"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="tliInfo">
    <xsd:complexContent mixed="true">
        <xsd:extension base="Events:Event">
            <xsd:sequence>
                <xsd:element name="level" type="SimpleTypes:TInteger"/>
                <xsd:element name="info" type="SimpleTypes:TString"/>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
</xsd:schema>
```

B.6 TCI-TL XML Schema for a Log

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://uri.etsi.org/ttcn-3/tci/TLI_v3_3_1.xsd"
    xmlns:TLI="http://uri.etsi.org/ttcn-3/tci/TLI_v3_3_1.xsd"
    xmlns:Types="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
    xmlns:Values="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
    xmlns:Events="http://uri.etsi.org/ttcn-3/tci/Events_v3_3_1.xsd"
    elementFormDefault="qualified">

    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Types_v3_3_1.xsd"
schemaLocation="Types_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Values_v3_3_1.xsd"
     schemaLocation="Values_v3_3_1.xsd"/>
    <xsd:import namespace="http://uri.etsi.org/ttcn-3/tci/Events_v3_3_1.xsd"
     schemaLocation="Events_v3_3_1.xsd"/>

    <xsd:element name="logfile" type="TLI:LogModule"/>
    <xsd:complexType name="LogModule">
        <xsd:sequence>
            <xsd:element name="header" type="TLI:Header"/>
            <xsd:element name="body" type="TLI:Body"/>
            <xsd:element name="trailer" type="TLI:Trailer" minOccurs="0"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="Header">
        <xsd:sequence>
           <!-- logging version -->
           <xsd:element name="version" type="xsd:string"/>
          <!-- begin of the log -->
            <xsd:element name="ts" type="xsd:long"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="Trailer">
        <xsd:choice>
            <xsd:any namespace="##any" processContents="skip" minOccurs="0" maxOccurs="unbounded"/>
        </xsd:choice>
    </xsd:complexType>

    <xsd:complexType name="Body">
        <xsd:choice maxOccurs="unbounded">

            <!-- test cases operations -->
            <xsd:element name="tliTcExecute" type="Events:tliTcExecute"/>
            <xsd:element name="tliTcStart" type="Events:tliTcStart"/>
            <xsd:element name="tliTcStop" type="Events:tliTcStop"/>
            <xsd:element name="tliTcStarted" type="Events:tliTcStarted"/>
            <xsd:element name="tliTcTerminated" type="Events:tliTcTerminated"/>

            <!-- control operations -->
            <xsd:element name="tliCtrlStart" type="Events:tliCtrlStart"/>
            <xsd:element name="tliCtrlStop" type="Events:tliCtrlStop"/>
            <xsd:element name="tliCtrlTerminated" type="Events:tliCtrlTerminated"/>

            <!-- asynchronous communication -->
            <xsd:element name="tliMSend_m" type="Events:tliMSend_m"/>
            <xsd:element name="tliMSend_c" type="Events:tliMSend_c"/>
            <xsd:element name="tliMSend_m_BC" type="Events:tliMSend_m_BC"/>
            <xsd:element name="tliMSend_c_BC" type="Events:tliMSend_c_BC"/>
            <xsd:element name="tliMSend_m_MC" type="Events:tliMSend_m_MC"/>
            <xsd:element name="tliMSend_c_MC" type="Events:tliMSend_c_MC"/>
            <xsd:element name="tliMDetected_m" type="Events:tliMDetected_m"/>
            <xsd:element name="tliMDetected_c" type="Events:tliMDetected_c"/>
            <xsd:element name="tliMMismatch_m" type="Events:tliMMismatch_m"/>
            <xsd:element name="tliMMismatch_c" type="Events:tliMMismatch_c"/>
            <xsd:element name="tliMReceive_m" type="Events:tliMReceive_m"/>
            <xsd:element name="tliMReceive_c" type="Events:tliMReceive_c"/>

            <!-- synchronous communication -->
            <xsd:element name="tliPrCall_m" type="Events:tliPrCall_m"/>
            <xsd:element name="tliPrCall_c" type="Events:tliPrCall_c"/>
            <xsd:element name="tliPrCall_m_BC" type="Events:tliPrCall_m_BC"/>
            <xsd:element name="tliPrCall_c_BC" type="Events:tliPrCall_c_BC"/>
            <xsd:element name="tliPrCall_m_MC" type="Events:tliPrCall_m_MC"/>
            <xsd:element name="tliPrCall_c_MC" type="Events:tliPrCall_c_MC"/>
```

```
<xsd:element name="tliPrGetCallDetected_m" type="Events:tliPrGetCallDetected_m"/>
<xsd:element name="tliPrGetCallDetected_c" type="Events:tliPrGetCallDetected_c"/>
<xsd:element name="tliPrGetCallMismatch_m" type="Events:tliPrGetCallMismatch_m"/>
<xsd:element name="tliPrGetCallMismatch_c" type="Events:tliPrGetCallMismatch_c"/>
<xsd:element name="tliPrGetCall_m"     type="Events:tliPrGetCall_m"/>
<xsd:element name="tliPrGetCall_c"     type="Events:tliPrGetCall_c"/>

<xsd:element name="tliPrReply_m"    type="Events:tliPrReply_m"/>
<xsd:element name="tliPrReply_c"    type="Events:tliPrReply_c"/>
<xsd:element name="tliPrReply_m_BC" type="Events:tliPrReply_m_BC"/>
<xsd:element name="tliPrReply_c_BC" type="Events:tliPrReply_c_BC"/>
<xsd:element name="tliPrReply_m_MC" type="Events:tliPrReply_m_MC"/>
<xsd:element name="tliPrReply_c_MC" type="Events:tliPrReply_c_MC"/>

<xsd:element name="tliPrGetReplyDetected_m" type="Events:tliPrGetReplyDetected_m"/>
<xsd:element name="tliPrGetReplyDetected_c" type="Events:tliPrGetReplyDetected_c"/>
<xsd:element name="tliPrGetReplyMismatch_m" type="Events:tliPrGetReplyMismatch_m"/>
<xsd:element name="tliPrGetReplyMismatch_c" type="Events:tliPrGetReplyMismatch_c"/>
<xsd:element name="tliPrGetReply_m"     type="Events:tliPrGetReply_m"/>
<xsd:element name="tliPrGetReply_c"     type="Events:tliPrGetReply_c"/>

<xsd:element name="tliPrRaise_m"    type="Events:tliPrRaise_m"/>
<xsd:element name="tliPrRaise_c"    type="Events:tliPrRaise_c"/>
<xsd:element name="tliPrRaise_m_BC" type="Events:tliPrRaise_m_BC"/>
<xsd:element name="tliPrRaise_c_BC" type="Events:tliPrRaise_c_BC"/>
<xsd:element name="tliPrRaise_m_MC" type="Events:tliPrRaise_m_MC"/>
<xsd:element name="tliPrRaise_c_MC" type="Events:tliPrRaise_c_MC"/>

<xsd:element name="tliPrCatchDetected_m"    type="Events:tliPrCatchDetected_m"/>
<xsd:element name="tliPrCatchDetected_c"    type="Events:tliPrCatchDetected_c"/>
<xsd:element name="tliPrCatchMismatch_m"    type="Events:tliPrCatchMismatch_m"/>
<xsd:element name="tliPrCatchMismatch_c"    type="Events:tliPrCatchMismatch_c"/>
<xsd:element name="tliPrCatch_m"    type="Events:tliPrCatch_m"/>
<xsd:element name="tliPrCatch_c"    type="Events:tliPrCatch_c"/>

<xsd:element name="tliPrCatchTimeoutDetected"
                               type="Events:tliPrCatchTimeoutDetected "/>
<xsd:element name="tliPrCatchTimeout"    type="Events:tliPrCatchTimeout"/>

<!-- components -->
<xsd:element name="tliCCreate" type="Events:tliCCreate"/>
<xsd:element name="tliCStart" type="Events:tliCStart"/>
<xsd:element name="tliCRunning" type="Events:tliCRunning"/>
<xsd:element name="tliCAlive" type="Events:tliCAlive"/>
<xsd:element name="tliCStop" type="Events:tliCStop"/>
<xsd:element name="tliCKill" type="Events:tliCKill"/>
<xsd:element name="tliCDoneMismatch" type="Events:tliCDoneMismatch"/>
<xsd:element name="tliCDone" type="Events:tliCDone"/>
<xsd:element name="tliCKilledMismatch" type="Events:tliCKilledMismatch"/>
<xsd:element name="tliCKilled" type="Events:tliCKilled"/>
<xsd:element name="tliCTerminated" type="Events:tliCTerminated"/>

<!-- ports -->
<xsd:element name="tliPConnect" type="Events:tliPConnect"/>
<xsd:element name="tliPDisconnect" type="Events:tliPDisconnect"/>
<xsd:element name="tliPMap" type="Events:tliPMap"/>
<xsd:element name="tliPUnmap" type="Events:tliPUnmap"/>
<xsd:element name="tliPClear" type="Events:tliPClear"/>
<xsd:element name="tliPStart" type="Events:tliPStart"/>
<xsd:element name="tliPStop" type="Events:tliPStop"/>
<xsd:element name="tliPHalt" type="Events:tliPHalt"/>

<!-- codec -->
<xsd:element name="tliDecode" type="Events:tliDecode"/>
<xsd:element name="tliEncode" type="Events:tliEncode"/>

<!-- timers -->
<xsd:element name="tliTTimeoutDetected" type="Events:tliTTimeoutDetected"/>
<xsd:element name="tliTTimeoutMismatch" type="Events:tliTTimeoutMismatch"/>
<xsd:element name="tliTTimeout" type="Events:tliTTimeout"/>
<xsd:element name="tliTStart" type="Events:tliTStart"/>
<xsd:element name="tliTStop" type="Events:tliTStop"/>
<xsd:element name="tliTRead" type="Events:tliTRead"/>
<xsd:element name="tliTRunning" type="Events:tliTRunning"/>

<!-- scopes -->
<xsd:element name="tliSEnter" type="Events:tliSEnter"/>
<xsd:element name="tliSLeave" type="Events:tliSLeave"/>
```

```
            <!-- statements -->
            <xsd:element name="tliVar" type="Events:tliVar"/>
            <xsd:element name="tliModulePar" type="Events:tliModulePar"/>
            <xsd:element name="tliGetVerdict" type="Events:tliGetVerdict"/>
            <xsd:element name="tliSetVerdict" type="Events:tliSetVerdict"/>
            <xsd:element name="tliLog" type="Events:tliLog"/>

            <!-- alt  -->
            <xsd:element name="tliAEnter" type="Events:tliAEnter"/>
            <xsd:element name="tliALeave" type="Events:tliALeave"/>
            <xsd:element name="tliADefaults" type="Events:tliADefaults"/>
            <xsd:element name="tliAActivate" type="Events:tliAActivate"/>
            <xsd:element name="tliADeactivate" type="Events:tliADeactivate"/>
            <xsd:element name="tliANomatch" type="Events:tliANomatch"/>
            <xsd:element name="tliARepeat" type="Events:tliARepeat"/>
            <xsd:element name="tliAWait" type="Events:tliAWait"/>

            <!-- action  -->
            <xsd:element name="tliAction" type="Events:tliAction"/>

            <!-- match  -->
            <xsd:element name="tliMatch" type="Events:tliMatch"/>
            <xsd:element name="tliMatchMismatch" type="Events:tliMatchMismatch"/>

            <!-- info  -->
            <xsd:element name="tliInfo" type="Events:tliInfo"/>
        </xsd:choice>
    </xsd:complexType>
</xsd:schema>
```

Annex C (informative): Bibliography

- INTOOL CGI/NPL038 (V2.2): "Generic Compiler/Interpreter interface; GCI Interface Specification" Infrastructural Tools, December 1996.
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